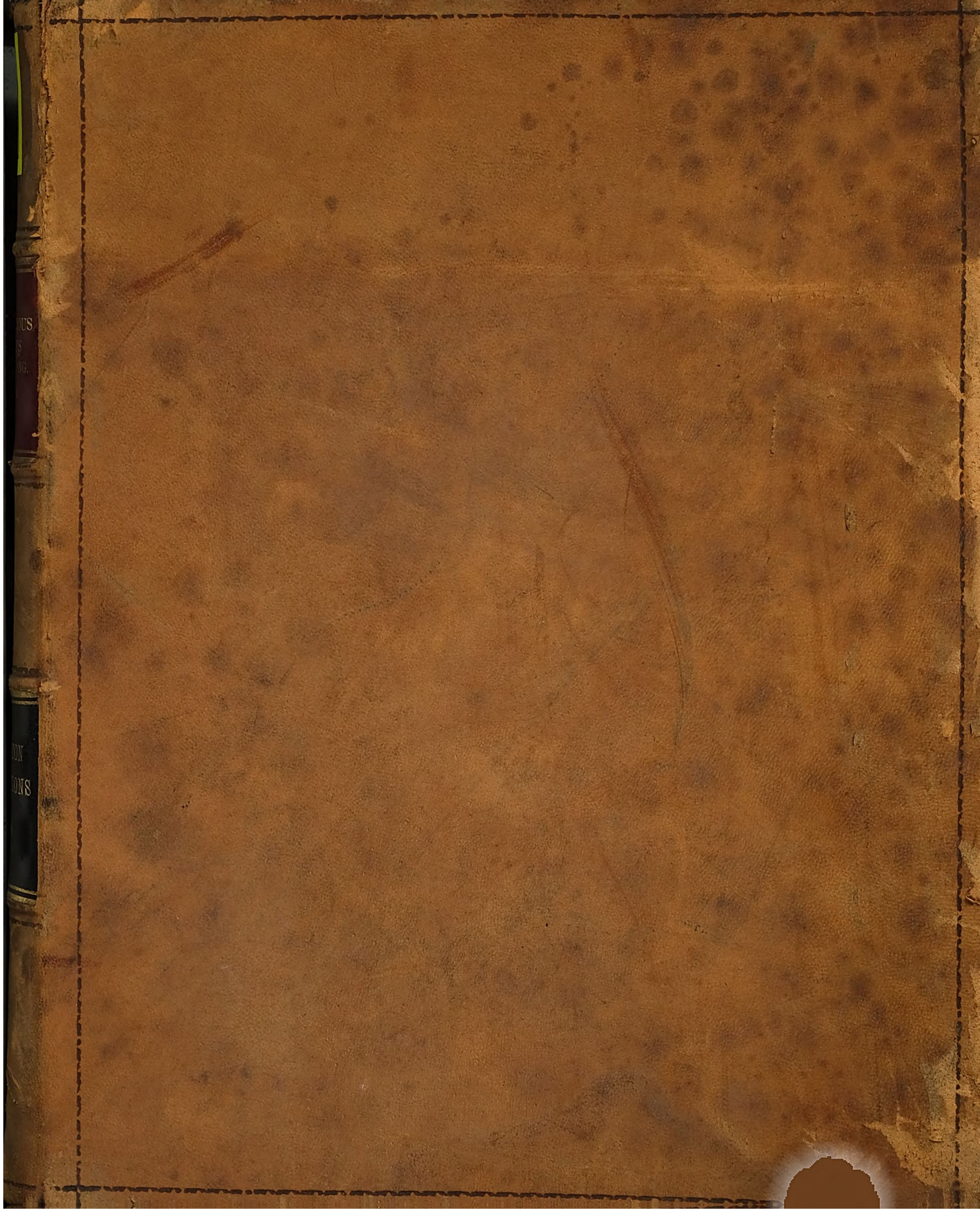




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THE
MISCELLANEOUS DOCUMENTS

OF THE
HOUSE OF REPRESENTATIVES

FOR THE
FIRST SESSION OF THE FIFTY-SECOND CONGRESS.

1891-'92.

VOLUME 38.

WASHINGTON:
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1892.

OBSERVATIONS

MADE DURING THE YEAR

1 8 8 8

AT THE

UNITED STATES NAVAL OBSERVATORY

WITH

2 APPENDICES AND 6 PLATES

CAPTAIN ROBERT L. PHYTHIAN, U. S. N.
SUPERINTENDENT

WASHINGTON
GOVERNMENT PRINTING OFFICE
1892



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INTRODUCTION
TO THE
WASHINGTON OBSERVATIONS
1888

REPORT OF THE SUPERINTENDENT

UNITED STATES NAVAL OBSERVATORY

Washington, October 15, 1888.

SIR: I have the honor to submit the annual report of the Naval Observatory, in compliance with the Bureau's order dated October 1, 1888 (No. 2600)

PERSONNEL

Changes in the personnel have occurred since the date of the last report, October 5, 1887, as follows: Detached—Ensign W. G. RICHARDSON, in October, 1887; Lieut. W. H. ALLEN, October 17, 1887; Lieut. H. W. SCHAEFER, December 31, 1887; Ensign V. O. CHASE, February 16, 1888; and Lieut. S. C. PAINE, April 23, 1888. Reported for duty—Ensign C. C. MARSH, December 19, 1887; Ensign H. S. CHASE, January 14, 1888

DISTRIBUTION OF WORK

The work of the Observatory is at present distributed as follows:

Assistant Superintendent—Commander A. D. BROWN.

Chronometers and time service—Ensign A. N. MAYER.

East transit instrument—Lieuts. L. C. HEILNER and B. W. HODGES.

Inspection of instruments—Ensign A. B. CLEMENTS.

Compass houses—Lieut. WILLIAM P. ELLIOTT and Ensign C. C. MARSH.

Great equatorial—Prof. ASAPH HALL and Ensign H. S. CHASE.

Transit circle—Prof. J. R. EASTMAN, Assistant Astronomers A. N. SKINNER, WILLIAM C. WINLOCK, and H. M. PAUL, and Computer WILLIAM M. BROWN.

The 9.6-inch equatorial—Prof. EDGAR FRISBY.

Photography—Lieut. A. G. WINTERHALTER.

Instrument maker—WILLIAM F. GARDNER.

Clerk—THOMAS HARRISON.

The meteorological observations are made by the watchmen, DENNIS HORIGAN, NICHOLAS CAHILL, and WILLIAM HENDERSON, under the supervision of the assistant superintendent.

Prof. WILLIAM HARKNESS is also attached to the Observatory for special duty as the member of the Transit-of-Venus Commission having direct charge of the reductions and computations of the observations of 1874 and 1882.

THE GREAT EQUATORIAL

(Professor HALL in charge)

This instrument is in good order and is in continual use. The flint lens was repolished by ALVAN CLARK & SONS in May, 1876, when the figure was a little improved. The objective retains its figure and polish well. Very little discoloration has appeared in the lenses, and their defining power is as good as ever. By comparison with several other objectives which Professor HALL has had an opportunity of making during recent years, he finds that our glass is an excellent one. The arrangements for setting the instrument on an object are very simple, but in practice they work well. An improvement might very well be made in the illumination of this instrument by the introduction of electric lights.

The micrometrical measurements have been those of the satellites of Saturn and Mars, and of the regular list of double stars. Some conjunctions of the inner satellites of Saturn with the minor axis of the ring were also observed. The surface of Saturn was carefully observed during the last opposition, and some drawings of this planet are nearly completed. Particular attention was given to the shadows cast by the ball of Saturn on his ring, to the markings on the ball, and to the divisions of the ring. Special attention was given to the surface of Mars during and after the last opposition, in the hope of seeing the "canals" described by several observers, but these singular objects could not be made out.

The reduction and discussion of the observations made with this instrument are now well advanced. Lieut. WILLIAM H. ALLEN, who rendered very efficient service in this part of the work, was detached last October. Ensign H. S. CHASE was assigned as an assistant on this instrument in March, 1888, and has been employed in copying and arranging for printing the notes on Saturn, and in reducing the measurements of the ring and ball of this planet. These observations are ready for publication. Mr. CHASE has also continued computations on the theory of Hyperion, the faint satellite of Saturn, which has a curious motion developed by the observations made with this instrument since 1875. The theory of this motion is now so far advanced that we hope to discuss all our observations of Hyperion, and to represent them within the limits of the probable errors for such a faint object.

The general working of the dome and shutters, and the engine for moving the dome, are in charge of Mr. GEORGE ANDERSON, who has performed his duties in a satisfactory manner.

THE TRANSIT CIRCLE

(Professor EASTMAN, in charge)

This instrument was employed in the observation of stars of the American Ephemeris, the sun, moon, and planets, and, until April, 1888, of such miscellaneous stars as were necessary to complete the data for the star catalogue. After April 4, 1888, the instrument was dismounted and cleaned. When it was re-mounted in July, observations were begun upon the sun, moon, major and minor planets, and such stars as were necessary for clock and instrumental corrections.

From October 1, 1887, to date, the whole number of observations with the transit circle was 1,970. Of these, 69 were of the sun, 40 of the moon, and 107 of the major planets. At the request of the director of Columbia College Observatory, New York, clock signals were exchanged on six nights in August and September last, to determine the longitude of that observatory.

Early in April, 1888, it was decided to undertake the observation of the zone of stars between -14° and -18° declination for the German Astronomical Society. The preparation of the observing lists was begun in April, and it is expected that the observations will begin within a few weeks.

Since the last report the transit-circle work for 1883 has been printed, and the work for 1884 is now in press. The computations for the work of 1885 are now more than half done; no work has been done on the computations for 1886. It is impossible to bring up properly the computing and copying now in arrears, or to attempt the work on the German zone with credit to this Observatory, without a greater force of experienced computers. An increase in this force has been recommended and urged by my predecessors for several years past. Two additional computers are asked for in the estimates for the next fiscal year, and it is earnestly hoped that they will be allowed.

THE 9.6-INCH EQUATORIAL

(Professor FRISBY, in charge)

This instrument has been used for the identification of stars in the revision of Yarnall's Catalogue, and in observations of small planets and comets, and of occultations of stars by the moon. Three comets have been seen during the year, and thirty-five observations made, all of which, as far as reduced, have been published in the *Astronomical Journal*. Nine observations of occultations of stars by the moon and a few observations of minor planets have been made. Two evenings in each week have been set apart for the accommodation of visitors.

All the work of the revision of Yarnall's Catalogue is substantially completed, and the main part of the printing done; the notes are nearly ready for the press, and it is believed that the whole work will soon be published.

CHRONOMETERS AND TIME-SERVICE

(Lieutenant PAINE in charge until April 23; since then Ensign MAYER)

Chronometers have been received, issued, cleaned, condemned, and purchased during the year as follows:

Class	Received from service	Issued	Cleaned	Condemned	Purchased
Box chronometers	36	39	48	9	14
Hack chronometers	8	9	5	.	.

The following is the disposition of the chronometers belonging to the Navy:

Class	Issued	On trial	Under repairs	Awaiting repairs	Loaned	Ready for issue
Box chronometers	150	26	42	21	3	42
Hack chronometers	70	.	2	133	3	5
Pocket chronometers	1	.	.	5	.	1
Pocket-hack chronometers	2	.	.	4	.	.
Comparing watches	.	.	.	4	.	.

Of those classed as issued, 25 box, 9 "hack," and 2 "pocket-hacks" are at the branch observatory at Mare Island.

The temperature room was in use from the 1st of January to the 16th of March, for the trial of 30 box chronometers submitted to competition. At the same time there were placed on trial 24 box and 1 pocket instrument, belonging to the Navy, which had recently been repaired and regulated. The trial was conducted in the same manner as was the preceding one, except that the hygrometric test was omitted. Of those submitted for competition, 14 were recommended for purchase. The results of the trial will be found recorded in the accompanying tables A and B.

The alterations in the temperature room, to which allusion was made in the last report, have so increased its efficiency that it will in future be practicable to begin the trials at an earlier date.

The chronometers that are now being returned to the Observatory from ships going out of commission were issued with rate-curve sheets. Upon some of these sheets the records have been continued, but in most instances they are either incomplete or entirely neglected. As these records are not only important and interesting histories of the sea-performance of chronometers, but also valuable to makers when instruments are placed in their hands for repairs, it is desirable that they should be kept up with systematic regularity. It is therefore recommended that the attention of commanding and navigating officers be called to the importance of so keeping them.

The Observatory continues to send daily over the wires of the Western Union Telegraph Company the time signal at noon of the seventy-fifth meridian. By it time-balls are dropped at Newport (R. I.), Wood's Holl, New York, Philadelphia, Baltimore, Washington, Hampton Roads, Savannah, and New Orleans. The signal is also sent over the lines of a number of railroads, and their time pieces are regulated by it.

On the Observatory clock line in this city there are 347 Gardner clocks, principally in Government buildings, which are automatically corrected by the daily noon signal.

EAST TRANSIT INSTRUMENT

(Lieutenant HEILNER in charge)

The condition of this instrument is good. All the clocks are performing well. Daily observations, when practicable, were made for the correction of the standard mean-time clock.

EXAMINATION OF INSTRUMENTS

This division has been under the general supervision of the assistant superintendent, Commander ALLAN D. BROWN, whose report is appended on page A.19

MAGNETIC INSTRUMENTS

(Lieutenant ELLIOTT in charge)

Observations of absolute declination have been made twice each day, the practice being to observe at 10 a.m. and 3 p.m. From these, appropriately grouped, the value of the photographed base lines of the declination magnetograms is deduced. The performance of the large declination magnet and theodolite is good, and the results are believed to be within a close limit of correctness.

An observation or experiment for the determination of the absolute horizontal intensity is made Tuesday of each week. About 20 vibration experiments, with inertia cylinder in place, have also been made for the verification of the value of K found at Kew observatory in 1879. The magnets used in these experiments and the instrument are in excellent condition. The forms are so arranged that the computation of results at the end of the year or series is only a few hours' work.

Three needles have been used in observations of inclination during the year, the practice being to use each needle once a week.

The performance of the declination and horizontal-force magnetographs has been excellent. They were re-adjusted at the beginning of the year and scale values re-determined with the following results:

Declination—One centimeter of ordinate = $11'.29$ arc.

Horizontal force—One centimeter of ordinate = $.0008$ c.g.s. units.

The vertical-force magnetograph has been at no time in satisfactory adjustment. A serious chipping of the agate knife-edge was discovered, and a new agate has been ordered. It is hoped that when the new agate arrives this delicate instrument can be successfully adjusted.

The computation, tabulation, and general record of observations have been kept up, as far as compatible with the scheme of the work.

THE LIBRARY

The library now contains over 12,000 volumes and 2,600 pamphlets. The accessions during the year have been 513:—459 volumes and 54 pamphlets. Of these, 288 were received in exchange and 225 were purchased.

The want of a librarian has been greatly felt the past year; and the services of an indexer and copyist, for which estimates have been submitted, are very much needed.

THE CENTENNIAL EXPOSITION AT CINCINNATI

The Observatory exhibit, a detailed report of which will be made at the close of the exposition, is a very creditable one. A marked feature of the exhibit is the time-ball dropped daily, by signal from the Observatory, from a staff on the main building. The apparatus for its manipulation was set up and adjusted by Mr. WILLIAM F. GARDNER, the inventor, to whom is due all the credit for its successful performance.

INTERNATIONAL ASTROPHOTOGRAPHIC CONGRESS

As mentioned in the last report, Lieut. A. G. WINTERHALTER was detailed by the Department as the representative of the Observatory at the International Astrophographic Congress, held at Paris in April, 1887. After the adjournment of the congress Lieutenant WINTERHALTER, by order of the Department, visited the principal observatories and other establishments of a scientific character in England, France, Germany, Austria, Holland and Italy. Since his return to the United States, in November last, he has been actively engaged in the preparation of his report, which is now nearly completed.

THE NEW NAVAL OBSERVATORY

The contract for the erection of the nine buildings comprising the new Observatory, awarded to Messrs. P. H. McLAUGHLIN & Co., of Washington, D. C., having been executed, the work upon them will be commenced at once.

The amount already appropriated will be sufficient to make the partial payments called for in the contract until the end of the second session of the present Congress. It is not sufficient, however, to admit of contracts being made for the domes until further appropriations shall be made.

CONNECTION WITH WASHBURN OBSERVATORY

By resolutions of the board of Regents of the University of Wisconsin, transmitted to the Department through President T. C. CHAMBERLIN, the free use of the Washburn Observatory during the removal of the Naval Observatory was tendered.

Co-ordination of work between the two observatories was invited by the same authorities and cordially accepted. Prof. ASAPH HALL, the senior astronomer at this observatory, was, with the consent of the Department, appointed consulting director of the Washburn Observatory, which office he now holds, and Prof. S. J. BROWN was detailed for duty there.

MISCELLANEOUS

A record of the state of the "seeing" has been kept by the watchmen, from which it appears that on 174 nights it was cloudy, on 113 the seeing was poor, on 63 it was fair, on 12 it was good, and on but 2 very good.

The names of 1,764 visitors have been recorded during the year, and 1,499 permits for night visitors have been issued.

The report of Prof. WILLIAM HARKNESS of the progress of work for the Transit-of-Venus Commission is herewith forwarded. (See page A.20)

Appended (page A.23) is a letter from Lieut. WINTERHALTER, preliminary to his report, to which allusion has been made. I invite the attention of the Bureau to his recommendations that provision be made to enable this Observatory to do the work which will fall to its share in charting the sky by photographic processes. Plans and estimates will be submitted as soon as they can be prepared.

Very respectfully,

R. L. PHYTHIAN
Captain, U. S. Navy, Superintendent.

The CHIEF OF THE BUREAU OF NAVIGATION
Navy Department.

TABLE A.—*Record of Competitive Trial of Chronometers, 1888 January–July*

[In temperature room from January 4 to March 16; after that in chronometer room]

Relative number				Jan. 4 to Jan. 11	Jan. 12 to Jan. 19	Jan. 20 to Jan. 27	Jan. 29 to Feb. 5
	Time						
	Temperature, Fahrenheit			44°.87	55°.02	70°.04	85°.01
	Relative humidity, per cent			69.5	68.5	70.7	69.5
	<i>Chronometer maker</i>	<i>No.</i>	<i>Description of balance, given by maker</i>	s	s	s	s
1	T. S. & J. D. Negus . .	1775	Ordinary balance, with Negus correction .	−2.636	−2.380	−2.061	−2.487
2	T. S. & J. D. Negus . .	1748	Flat-rim balance	+0.543	−0.023	−0.204	−0.094
3	T. S. & J. D. Negus . .	1767	Ordinary balance, with Negus correction .	−1.636	−1.451	−1.633	−1.809
4	William Bond & Son . .	529	Hartnup balance	−0.171	+0.441	+0.439	−0.344
5	T. S. & J. D. Negus . .	1723	Ordinary balance, with Negus correction .	+0.864	+0.513	+0.939	+0.763
6	T. S. & J. D. Negus . .	1768	Ordinary balance, with Negus correction .	−1.814	−1.130	−0.669	−1.701
7	William Bond & Son . .	520	Plain balance	−2.529	−1.273	−0.919	−1.880
8	T. S. & J. D. Negus . .	1773	Ordinary balance, with Negus correction .	−1.064	−1.201	−0.990	−0.880
9	H. H. Heinrich	811	Ordinary balance, with Heinrich's auxiliary	−0.064	+0.906	+0.653	+0.084
10	T. S. & J. D. Negus . .	1721	Ordinary balance	−2.064	−1.059	−0.669	−1.737
11	T. S. & J. D. Negus . .	1762	Ordinary balance	−3.029	−1.737	−0.847	−1.666
12	William Bond & Son . .	514	Hartnup balance	−1.564	−1.987	−2.419	−3.416
13	John Bliss & Co. . . .	2809	Ordinary balance	−1.564	−0.594	+0.260	−0.844
14	T. S. & J. D. Negus . .	1739	Ordinary balance	−3.421	−1.666	−0.240	−0.451
15	H. H. Heinrich	3458	Ordinary balance, with Heinrich's auxiliary palladium spring.	−1.421	−1.559	−1.276	−0.309
16	William Bond & Son . .	501	Plain balance	−1.564	−0.273	+1.010	−0.094
17	T. S. & J. D. Negus . .	1765	Ordinary balance, with Negus correction .	−2.921	−1.951	−1.847	−2.987
18	John Bliss & Co. . . .	2818	Bliss auxiliary balance	−1.493	−0.380	+0.724	+0.013
19	William Bond & Son . .	482	Plain balance	−1.029	−0.059	+0.403	−0.916
20	John Bliss & Co. . . .	2810	Bliss auxiliary balance	−0.243	+0.763	+0.546	−0.023
21	T. S. & J. D. Negus . .	1774	Ordinary balance, with Negus correction .	−2.064	−1.987	−1.740	−1.630
22	T. S. & J. D. Negus . .	1776	Ordinary balance, with Negus correction .	−1.386	−1.630	−1.097	−1.451
23	John Bliss & Co. . . .	2851	Ordinary balance	−2.243	−0.130	+1.296	+0.727
24	John Bliss & Co. . . .	2852	Ordinary balance	−3.529	−1.916	−0.347	−0.594
25	William Bond & Son . .	480	Plain balance	+0.364	+1.013	+0.046	−2.094
26	John Bliss & Co. . . .	2813	Bliss auxiliary balance	+0.007	+1.513	+1.831	+1.656
27	John Bliss & Co. . . .	2853	Ordinary balance	−2.100	−0.773	+0.724	+1.013
28	John Bliss & Co. . . .	2792	Auxiliary balance	+1.471	+1.906	+1.010	+1.584
29	John Bliss & Co. . . .	2827	Ordinary balance	−0.850	+0.656	+2.296	+1.477
30	John Bliss & Co. . . .	2829	Ordinary balance	−2.171	−1.059	+0.939	+1.299

TABLE A.—Record of Competitive Trial of Chronometers, 1888 January–July—Continued

Relative number	Time {		Feb. 6 to Feb. 13	Feb. 14 to Feb. 21	Feb. 22 to Feb. 29	Mar. 1 to Mar. 8	Mar. 9 to Mar. 16	Mar. 16 to Mar. 23	Mar. 23 to Mar. 30
	Temperature, Fahrenheit		90°.01	85°.02	69°.93	54°.95	44°.90	51°.93	52°.75
	Relative humidity, per cent		70.0	70.0	68.6	67.6	67.7	60.0	64.6
	<i>Chronometer maker</i>	<i>No.</i>	s	s	s	s	s	s	s
1	T. S. & J. D. Negus . . .	1775	—2.567	—2.194	—1.994	—2.051	—1.997	—1.719	—1.704
2	T. S. & J. D. Negus . . .	1748	—0.067	—0.301	—0.494	—0.409	—0.140	—0.183	—0.311
3	T. S. & J. D. Negus . . .	1767	—1.889	—1.730	—1.494	—1.837	—1.783	—1.469	—1.490
4	William Bond & Son . . .	529	—0.781	—0.551	+0.077	—0.123	—0.461	—0.040	—0.061
5	T. S. & J. D. Negus . . .	1723	+0.754	+0.770	+0.720	+0.484	+1.074	+1.103	+0.974
6	T. S. & J. D. Negus . . .	1768	—2.031	—1.659	—0.816	—0.801	—1.140	—0.683	—0.704
7	William Bond & Son . . .	520	—2.353	—2.230	—1.244	—1.587	—2.533	—1.254	—1.311
8	T. S. & J. D. Negus . . .	1773	—0.746	—0.409	—0.280	—0.373	—0.497	—0.290	—0.347
9	H. H. Heinrich	811	+0.076	—0.087	+0.291	+0.020	—0.140	+0.317	+0.474
10	T. S. & J. D. Negus . . .	1721	—2.389	—1.944	—1.244	—1.730	—2.211	—1.897	—1.954
11	T. S. & J. D. Negus . . .	1762	—2.424	—1.766	—1.030	—1.944	—2.961	—1.933	—1.883
12	William Bond & Son . . .	514	—3.103	—2.587	—2.030	—1.801	—2.176	—1.897	—2.061
13	John Bliss & Co.	2809	—1.317	—0.873	+0.326	—0.587	—2.319	—1.183	—0.883
14	T. S. & J. D. Negus . . .	1739	—0.889	—0.659	—0.316	—1.873	—3.819	—2.326	—2.097
15	H. H. Heinrich	3458	—0.281	—0.909	—1.101	—2.159	—1.997	—2.004	—1.847
16	William Bond & Son . . .	501	—0.139	+0.127	+0.970	+0.520	—0.854	+0.496	+0.439
17	T. S. & J. D. Negus . . .	1765	—3.460	—2.909	—1.959	—1.516	—2.604	—1.826	—1.883
18	John Bliss & Co.	2818	—0.389	—0.337	+0.684	+0.627	—0.533	+0.210	+0.153
19	William Bond & Son . . .	482	—1.924	—1.516	—0.637	—0.730	—0.783	—0.754	—0.454
20	John Bliss & Co.	2810	+0.433	+0.413	+0.756	+1.341	+0.539	+1.139	+0.974
21	T. S. & J. D. Negus . . .	1774	—1.603	—1.087	—1.030	—0.801	—0.247	—0.326	—0.669
22	T. S. & J. D. Negus . . .	1776	—1.710	—1.087	—0.423	—0.480	—0.283	—0.290	—0.419
23	John Bliss & Co.	2851	+0.111	+0.841	+1.613	+0.699	—1.104	+0.424	+0.403
24	John Bliss & Co.	2852	—0.817	—0.016	+0.256	—0.909	—2.211	—1.040	—0.740
25	William Bond & Son . . .	480	—2.996	—2.301	—0.709	—0.266	—0.604	—0.147	—0.383
26	John Bliss & Co.	2813	+3.647	+1.663	+2.756	+1.806	+0.753	+1.531	+1.367
27	John Bliss & Co.	2853	+0.647	+1.306	+1.756	+0.984	+0.039	+1.281	+1.260
28	John Bliss & Co.	2792	+1.397	+1.484	+0.863	+2.020	+1.610	+2.246	+2.296
29	John Bliss & Co.	2827	+1.326	+2.020	+2.970	+2.127	+0.717	+2.674	+2.617
30	John Bliss & Co.	2829	+1.540	+2.127	+2.827	+1.556	—0.176	+1.174	+1.224

TABLE A.—Record of Competitive Trial of Chronometers, 1888 January–July—Continued

Relative number	Time		Mar. 30 to Apr. 6	Apr. 6 to Apr. 13	Apr. 13 to Apr. 20	Apr. 20 to Apr. 27	Apr. 27 to May 4	May 4 to May 11
	Temperature, Fahrenheit		65°.85	65°.53	63°.08	61°.75	71°.15	73°.17
	Relative humidity, per cent . . .		63.5	58.0	58.0	52.0	58.0	62.7
	<i>Chronometer maker</i>	<i>No.</i>	s	s	s	s	s	s
1	T. S. & J. D. Negus . . .	1775	—1.279	—1.333	—1.337	—1.256	—1.041	—1.021
2	T. S. & J. D. Negus . . .	1748	—0.529	—0.726	—0.659	—0.613	—0.684	—0.271
3	T. S. & J. D. Negus . . .	1767	—0.921	—0.797	—0.694	—0.577	—0.434	—0.343
4	William Bond & Son . . .	529	+0.257	+0.167	+0.270	+0.280	+0.316	+0.300
5	T. S. & J. D. Negus . . .	1723	+1.079	+1.024	+1.163	+1.459	+1.030	+0.907
6	T. S. & J. D. Negus . . .	1768	—0.493	—0.440	—0.409	—0.256	—0.291	—0.343
7	William Bond & Son . . .	520	—0.814	—1.011	—0.944	—0.863	—0.684	—0.521
8	T. S. & J. D. Negus . . .	1773	+0.293	+0.310	+0.234	+0.280	+0.709	+0.801
9	H. H. Heinrich	811	+0.864	+0.917	+0.734	+0.744	+1.173	+1.407
10	T. S. & J. D. Negus . . .	1721	—1.136	—1.154	—1.123	—1.041	—0.791	—0.629
11	T. S. & J. D. Negus . . .	1762	—1.064	—1.119	—1.016	—0.899	—1.041	—0.807
12	William Bond & Son . . .	514	—1.743	—1.654	—1.337	—1.041	—1.256	—1.020
13	John Bliss & Co.	2809	+0.221	+0.346	+0.413	+0.244	+0.351	+0.407
14	T. S. & J. D. Negus . . .	1739	—0.529	—0.619	—0.266	—0.399	—0.041	+0.014
15	H. H. Heinrich	3458	—1.564	—1.797	—1.587	—1.541	—1.863	—1.557
16	William Bond & Son . . .	501	+1.614	+1.310	+1.234	+1.494	+1.637	+1.729
17	T. S. & J. D. Negus . . .	1765	—0.779	—0.761	—0.944	—0.934	—0.756	—0.843
18	John Bliss & Co.	2818	+0.579	+0.810	+1.449	+1.566	+1.137	+1.336
19	William Bond & Son . . .	482	—0.243	—0.119	—0.194	—0.256	—0.184	—0.093
20	John Bliss & Co.	2810	+1.186	+1.024	+1.413	+1.387	+0.851	+0.764
21	T. S. & J. D. Negus . . .	1774	—0.707	—0.440	—0.230	—0.113	+0.030	+0.229
22	T. S. & J. D. Negus . . .	1776	—0.171	—0.011	+0.234	+0.280	+0.173	+1.121
23	John Bliss & Co.	2851	+2.043	+2.060	+2.199	+2.173	+2.816	+3.014
24	John Bliss & Co.	2852	+0.829	+0.810	+0.806	+0.744	+1.530	+1.943
25	William Bond & Son . . .	480	—0.100	—0.069	+0.127	+0.209	—0.149	—0.164
26	John Bliss & Co.	2813	+2.007	+1.953	+1.984	+2.030	+2.173	+2.229
27	John Bliss & Co.	2853	+2.436	+2.560	+2.449	+2.601	+3.101	+3.336
28	John Bliss & Co.	2792	+1.543	+1.381	+1.699	+1.887	+1.030	+1.121
29	John Bliss & Co.	2827	+4.221	+4.167	+4.199	+4.387	+5.101	+5.443
30	John Bliss & Co.	2829	+1.900	+2.703	+3.199	+3.137	+3.397	+3.550

TABLE A.—*Record of Competitive Trial of Chronometers, 1888 January–July—Continued*

Relative number	Time {		May 11 to May 18	May 18 to May 25	May 25 to June 1	June 1 to June 8	June 8 to June 15	June 15 to June 22
	Temperature, Fahrenheit		71°.04	67°.66	75°.18	73°.15	75°.53	82°.09
	Relative humidity, per cent . . .		60.5	62.8	70.1	66.6	68.0	66.7
	<i>Chronometer maker</i>	<i>No.</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>
1	T. S. & J. D. Negus . . .	1775	—1.083	—0.837	—0.890	—0.921	—0.847	—0.816
2	T. S. & J. D. Negus . . .	1748	—0.369	—0.337	+0.039	+0.186	+0.081	+0.149
3	T. S. & J. D. Negus . . .	1767	—0.440	—0.230	—0.354	—0.386	—0.276	—0.566
4	William Bond & Son . . .	529	+0.167	+0.449	+0.396	+0.436	+0.439	+0.184
5	T. S. & J. D. Negus . . .	1723	+0.703	+0.949	+0.896	+0.686	+0.760	+0.970
6	T. S. & J. D. Negus . . .	1768	—0.476	—0.230	—0.390	—0.243	—0.169	—0.744
7	William Bond & Son . . .	520	—0.869	—0.337	—0.997	—1.350	—1.383	—1.601
8	T. S. & J. D. Negus . . .	1773	+0.703	+0.734	+0.824	+0.757	+0.939	+0.970
9	H. H. Heinrich	811	+1.274	+1.091	+1.074	+1.257	+1.189	+1.149
10	T. S. & J. D. Negus . . .	1721	—0.761	—0.480	—0.640	—0.671	—0.704	—1.101
11	T. S. & J. D. Negus . . .	1762	—0.940	—0.730	—0.747	—0.707	—0.669	—1.066
12	William Bond & Son . . .	514	—1.083	—0.944	—0.640	—0.779	—0.454	—0.744
13	John Bliss & Co.	2809	+0.239	+0.377	+0.039	+0.293	+0.189	—0.351
14	T. S. & J. D. Negus . . .	1739	—0.190	—0.159	+0.074	+0.114	—0.240	—0.244
15	H. H. Heinrich	3458	—1.083	—1.123	—1.461	—1.636	—1.490	—1.851
16	William Bond & Son . . .	501	+1.596	+1.663	+1.289	+1.543	+1.331	+0.791
17	T. S. & J. D. Negus . . .	1765	—1.011	—0.587	—1.211	—1.171	—1.204	—1.709
18	John Bliss & Co.	2818	+1.060	+1.306	+1.003	+1.114	+1.046	+0.720
19	William Bond & Son . . .	482	—0.369	—0.194	—0.211	—0.100	—0.133	—0.494
20	John Bliss & Co.	2810	+0.810	+1.091	+0.646	+0.579	+0.689	+0.756
21	T. S. & J. D. Negus . . .	1774	+0.203	+0.377	+0.324	+0.436	+0.546	+0.506
22	T. S. & J. D. Negus . . .	1776	+0.167	+0.413	+0.289	+0.364	+0.439	+0.327
23	John Bliss & Co.	2851	+2.953	+3.056	+3.360	+3.364	+3.474	+3.113
24	John Bliss & Co.	2852	+1.953	+2.020	+2.253	+2.364	+2.439	+2.434
25	William Bond & Son . . .	480	—0.190	+0.270	—0.247	—0.136	—0.276	—0.887
26	John Bliss & Co.	2813	+2.167	+2.270	+2.181	+2.329	+2.331	+2.041
27	John Bliss & Co.	2853	+3.310	+3.556	+3.896	+3.864	+4.081	+4.113
28	John Bliss & Co.	2792	+1.096	+1.199	+1.503	+1.293	+1.510	+1.827
29	John Bliss & Co.	2827	+5.060	+5.413	+5.898	+5.936	+6.153	+5.899
30	John Bliss & Co.	2829	+3.677	+3.091	+3.860	+4.114	+4.189	+3.970

TABLE A.—Record of Competitive Trial of Chronometers, 1888 January–July—Continued

Relative number	Time {		June 22 to June 29	June 29 to July 6	Tempera- ture of compensa- tion	Tempera- ture constant	First trial Number	Final trial Number
	Temperature, Fahrenheit		83°. 56	74°. 95				
	Relative humidity, per cent . . .		66. 8	62. 0				
	<i>Chronometer maker</i>	<i>No.</i>	<i>s</i>	<i>s</i>	<i>o</i>	<i>s</i>		
1	T. S. & J. D. Negus . . .	1775	—0. 919	—0. 831	68. 129	—0. 00111	4. 8059	6. 3188
2	T. S. & J. D. Negus . . .	1748	+0. 010	+0. 133	69. 500	+0. 000633	3. 8825	6. 6381
3	T. S. & J. D. Negus . . .	1767	—0. 597	—0. 403	66. 733	—0. 000643	2. 4891	6. 6507
4	William Bond & Son . . .	529	+0. 010	+0. 383	64. 347	—0. 00179	9. 2838	10. 3242
5	T. S. & J. D. Negus . . .	1723	+0. 974	+0. 776	75. 102	—0. 000875	10. 6658	13. 2902
6	T. S. & J. D. Negus . . .	1768	—0. 740	—0. 046	65. 381	—0. 00258	12. 3659	13. 4268
7	William Bond & Son . . .	520	—1. 883	—1. 331	66. 475	—0. 00293	13. 4033	16. 4309
8	T. S. & J. D. Negus . . .	1773	+0. 867	+0. 990	76. 662	—0. 000356	12. 3121	16. 6802
9	H. H. Heinrich	811	+1. 010	+0. 740	62. 780	—0. 00107	11. 6065	16. 7141
10	T. S. & J. D. Negus . . .	1721	—1. 276	—0. 724	67. 470	—0. 00294	16. 4786	18. 2742
11	T. S. & J. D. Negus . . .	1762	—1. 204	—0. 724	70. 553	—0. 00373	17. 4764	19. 2989
12	William Bond & Son . . .	514	—0. 811	—0. 367	51. 426	—0. 000993	12. 8261	23. 8485
13	John Bliss & Co.	2809	—0. 454	+0. 204	69. 012	—0. 00452	23. 8026	24. 4915
14	T. S. & J. D. Negus . . .	1739	—0. 347	—0. 367	75. 150	—0. 00393	22. 8828	25. 9804
15	H. H. Heinrich	3458	—2. 276	—2. 117	171. 902	—0. 000204	16. 7277	26. 0913
16	William Bond & Son . . .	501	+1. 010	+1. 490	69. 564	—0. 00409	24. 9137	26. 1681
17	T. S. & J. D. Negus . . .	1765	—1. 919	—1. 296	59. 586	—0. 00195	15. 2523	27. 3627
18	John Bliss & Co.	2818	+0. 581	+1. 526	68. 523	—0. 00321	21. 7527	27. 9031
19	William Bond & Son . . .	482	—0. 069	—0. 224	65. 520	—0. 00306	27. 8888	29. 1884
20	John Bliss & Co.	2810	+0. 831	+0. 740	—46. 863	—0. 000122	26. 0661	29. 3785
21	T. S. & J. D. Negus . . .	1774	+0. 474	+0. 776	55. 000	+0. 00004	25. 0864	29. 4128
22	T. S. & J. D. Negus . . .	1776	+0. 260	+0. 669	68. 004	—0. 00178	27. 3121	29. 5322
23	John Bliss & Co.	2851	+2. 831	+3. 526	72. 038	—0. 00409	29. 1727	34. 0568
24	John Bliss & Co.	2852	+2. 296	+2. 526	75. 103	—0. 00362	36. 8166	41. 1015
25	William Bond & Son . . .	480	—1. 133	—0. 189	53. 004	—0. 00247	35. 4933	43. 7302
26	John Bliss & Co.	2813	+1. 939	+2. 240	70. 000	—0. 00282	46. 3169	47. 2194
27	John Bliss & Co.	2853	+4. 046	+4. 347	76. 543	—0. 00269	55. 0717	59. 3981
28	John Bliss & Co.	2792	+1. 617	+1. 133	71. 980	+0. 00362	57. 5067	60. 5692
29	John Bliss & Co.	2827	+5. 939	+6. 204	71. 259	—0. 00473	55. 3057	69. 2186
30	John Bliss & Co.	2829	+4. 081	+4. 383	76. 087	—0. 00401	117. 3628	135. 4253

TABLE B.—*Record of Trial of Repaired Chronometers, 1888 January–July*

[In temperature room from January 4 to March 16; after that in chronometer room. Explanation of abbreviations in second column: Bo., William Bond & Son; Bl., John Bliss & Co.; N., T. S. & J. D. Negus.]

Relative number	Repaired by	Time {		Jan. 4 to Jan. 11	Jan. 12 to Jan. 19	Jan. 20 to Jan. 27	Jan. 29 to Feb. 5	Feb. 6 to Feb. 13	Feb. 14 to Feb. 21
		Temperature, Fahrenheit		44°. 87	55°. 02	70°. 04	85°. 01	90°. 01	85°. 02
		Relative humidity, per cent		69. 5	68. 5	70. 7	70. 0	69. 5	70. 0
		<i>Chronometer maker</i>	<i>No.</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>
1	N.	T. S. & J. D. Negus	1283	—2. 493	—1. 594	—0. 990	—1. 630	—2. 210	—1. 694
2	N.	T. S. & J. D. Negus	1343	—3. 529	—2. 237	—1. 383	—2. 059	—2. 496	—2. 159
3	Bl.	John Hutton	318	—1. 207	—0. 273	+0. 010	—0. 773	—1. 031	—0. 730
4	N.	T. S. & J. D. Negus	1345	—1. 993	—0. 273	+0. 689	+0. 263	—0. 103	+0. 199
5	N.	T. S. & J. D. Negus	1308	—4. 671	—3. 130	—2. 669	—3. 166	—3. 674	—3. 123
6	N.	T. S. & J. D. Negus	1273	—2. 064	—1. 416	—1. 061	—2. 201	—2. 674	—2. 266
7	N.	T. S. & J. D. Negus	863	—1. 671	—0. 737	—0. 526	—0. 987	—1. 531	—1. 159
8	N.	T. S. & J. D. Negus	1245	—1. 421	+0. 049	+0. 760	+0. 013	—0. 174	+0. 091
9	N.	T. S. & J. D. Negus	1298	—2. 314	—0. 880	—0. 204	—1. 023	—1. 639	—1. 301
10	N.	T. S. & J. D. Negus	1220	—2. 207	—0. 880	—0. 169	—0. 987	—1. 353	—0. 980
11	N.	T. S. & J. D. Negus	1259	—2. 421	—1. 523	—1. 061	—2. 166	—2. 674	—2. 337
12	Bl.	John Hutton	352	—2. 529	—1. 594	—1. 097	—2. 237	—3. 067	—2. 480
13	Bl.	John Hutton	225	—2. 386	—0. 594	+0. 796	+0. 549	+0. 039	+0. 341
14	N.	T. S. & J. D. Negus	1115	—1. 314	—0. 380	—0. 133	—1. 451	—2. 174	—1. 623
15	Bl.	John Bliss & Co	2484	+0. 329	+1. 691	+2. 689	+1. 941	+1. 040	+1. 591
16	N.	T. S. & J. D. Negus	1448	—1. 814	—0. 237	+0. 010	—1. 523	—2. 353	—1. 659
17	N.	T. S. & J. D. Negus	740	—3. 171	—2. 130	—1. 919	—3. 416	—3. 924	—3. 551
18	N.	T. S. & J. D. Negus	1319	—1. 064	+0. 227	+0. 546	—0. 594	—1. 460	—0. 980
19	Bo.	John Munroe	275	—2. 171	—1. 951	—1. 240	—1. 380	—1. 317	—1. 337
20	Bl.	John Bliss & Co	2768	—4. 207	—2. 666	—1. 633	—1. 666	—0. 960	—0. 766
21	Bo.	Barraud	$\frac{2}{930}$	—2. 921	—1. 809	—1. 240	—2. 880	—2. 889	—2. 623
22	N.	T. S. & J. D. Negus	1583	—0. 243	+0. 691	+0. 617	—1. 023	—1. 853	—1. 051
23	N.	T. S. & J. D. Negus	1452	—1. 279	+0. 513	+1. 617	+0. 263	—0. 674	—0. 337
24	Bo.	Barraud	1509	+1. 364	+2. 120	+2. 331	+0. 441	—0. 889	—0. 944

TABLE B.—Record of Trial of Repaired Chronometers, 1888 January–July—Continued

Relative number	Repaired by	Time {		Feb. 22 to Feb. 29	Mar. 1 to Mar. 8	Mar. 9 to Mar. 16	Mar. 16 to Mar. 23	Mar. 23 to Mar. 30	Mar. 30 to Apr. 6
		Temperature, Fahrenheit		69°. 93	54°. 95	44°. 90	51°. 93	52°. 75	65°. 85
		Relative humidity, per cent		68. 6	67. 6	67. 7	60. 0	64. 6	63. 5
		<i>Chronometer maker</i>	<i>No.</i>						
1	N.	T. S. & J. D. Negus	1283	^s —0. 851	^s —1. 480	^s —2. 283	^s —1. 576	^s —1. 633	^s —1. 029
2	N.	T. S. & J. D. Negus	1343	—1. 601	—2. 373	—3. 354	—2. 255	—2. 169	—1. 171
3	Bl.	John Hutton	318	—0. 137	—0. 730	—1. 569	—0. 790	—0. 847	+0. 293
4	N.	T. S. & J. D. Negus	1345	+0. 541	—0. 373	—1. 783	—0. 361	—0. 383	+0. 971
5	N.	T. S. & J. D. Negus	1308	—2. 494	—3. 409	—5. 104	—3. 861	—3. 883	—2. 600
6	N.	T. S. & J. D. Negus	1273	—1. 066	—1. 230	—2. 176	—1. 361	—1. 526	—0. 814
7	N.	T. S. & J. D. Negus	863	—0. 137	—0. 659	—1. 676	—0. 826	—0. 883	+0. 293
8	N.	T. S. & J. D. Negus	1245	+0. 827	+0. 199	—1. 461	—0. 504	—0. 419	+1. 007
9	N.	T. S. & J. D. Negus	1298	—0. 387	—0. 873	—1. 926	—0. 469	—1. 097	—0. 243
10	N.	T. S. & J. D. Negus	1220	—0. 244	—1. 266	—2. 533	—1. 290	—1. 204	—0. 136
11	N.	T. S. & J. D. Negus	1259	—1. 351	—1. 873	—3. 283	—2. 147	—1. 811	—1. 029
12	Bl.	John Hutton	352	—1. 316	—1. 587	—2. 961	—2. 111	—1. 919	—0. 957
13	Bl.	John Hutton	225	+0. 541	—0. 587	—2. 533	—0. 683	—0. 669	+0. 936
14	N.	T. S. & J. D. Negus	1115	—0. 530	—0. 623	—1. 926	—0. 897	—0. 847	+0. 114
15	Bl.	John Bliss & Co	2484	+2. 041	+1. 234	+0. 074	+1. 389	+1. 581	+2. 471
16	N.	T. S. & J. D. Negus	1448	—0. 494	—0. 337	—1. 461	—0. 433	—0. 347	+0. 079
17	N.	T. S. & J. D. Negus	740	—2. 030	—2. 016	—3. 176	—2. 254	—2. 419	—1. 636
18	N.	T. S. & J. D. Negus	1319	—0. 137	—0. 551	—1. 497	—0. 290	—0. 490	+0. 471
19	Bo.	John Munroe	275	—1. 601	—2. 551	—4. 104	—2. 826	—2. 990	—1. 600
20	Bl.	John Bliss & Co	2768	—1. 137	—2. 051	—3. 497	—2. 040	—1. 883	—0. 707
21	Bo.	Barraud	$\frac{2}{930}$	—1. 316	—2. 230	—3. 426	—2. 076	—2. 169	—1. 171
22	N.	T. S. & J. D. Negus	1583	+0. 077	—0. 587	—0. 569	—0. 040	—0. 097	+0. 757
23	N.	T. S. & J. D. Negus	1452	+0. 149	—0. 623	—1. 854	—0. 040	—0. 026	+1. 364
24	Bo.	Barraud	1509	—0. 030	—0. 266	—1. 176	—0. 540	—0. 776	—0. 100

TABLE B.—*Record of Trial of Repaired Chronometers, 1888 January–July—Continued*

Relative number	Repaired by	Time {		Apr. 6 to Apr. 13	Apr. 13 to Apr. 20	Apr. 20 to Apr. 27	Apr. 27 to May 4	May 4 to May 11	May 11 to May 18
		Temperature, Fahrenheit		65°.53	63°.08	61°.75	71°.15	73°.17	71°.14
		Relative humidity, per cent		58.0	58.0	52.0	58.0	62.7	60.5
		<i>Chronometer maker</i>	<i>No.</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>	<i>s</i>
1	N.	T. S. & J. D. Negus	1283	—1.011	—1.016	—1.041	—0.934	—0.843	—0.869
2	N.	T. S. & J. D. Negus	1343	—1.119	—0.980	—1.006	—0.791	—0.736	—0.869
3	Bl.	John Hutton	318	+0.274	+0.234	+0.316	+0.673	+0.836	+0.703
4	N.	T. S. & J. D. Negus	1345	+0.953	+0.949	+0.816	+1.351	+1.443	+1.203
5	N.	T. S. & J. D. Negus	1308	—2.619	—2.694	—2.756	—2.541	—2.414	—2.583
6	N.	T. S. & J. D. Negus	1273	—0.654	—0.587	—0.506	—0.649	—0.629	—0.583
7	N.	T. S. & J. D. Negus	863	+0.274	+0.591	+0.566	+0.780	+0.764	+0.739
8	N.	T. S. & J. D. Negus	1245	+0.846	+0.663	+0.566	+0.780	+0.693	+0.846
9	N.	T. S. & J. D. Negus	1298	—0.190	—0.194	—0.220	—0.077	+0.050	—0.154
10	N.	T. S. & J. D. Negus	1220	—0.047	+0.020	+0.101	+0.244	+0.229	+0.024
11	N.	T. S. & J. D. Negus	1259	—1.047	—0.944	—1.077	—1.041	—1.164	—1.011
12	Bl.	John Hutton	352	—0.976	—1.194	—1.149	—1.006	—1.057	—1.511
13	Bl.	John Hutton	225	+0.846	+0.841	+0.709	+1.066	+1.193	+1.096
14	N.	T. S. & J. D. Negus	1115	+0.060	+0.161	+0.209	+0.137	+0.229	+0.096
15	Bl.	John Bliss & Co	2484	+2.203	+2.341	+2.351	+2.601	+2.693	+2.489
16	N.	T. S. & J. D. Negus	1448	+0.024	+0.127	+0.101	+0.030	+0.014	+0.096
17	N.	T. S. & J. D. Negus	740	—1.797	—1.694	—1.684	—1.720	—1.771	—1.940
18	N.	T. S. & J. D. Negus	1319	+0.203	+0.199	+0.244	+0.280	+0.300	+0.203
19	Bo.	John Munroe	275	—1.619	—1.730	—1.720	—1.399	—1.343	—1.619
20	Bl.	John Bliss & Co	2768	—0.833	—1.051	—1.077	—0.649	—0.450	—1.297
21	Bo.	Barraud	$\frac{2}{930}$	—1.297	—1.194	—1.149	—1.113	—1.129	—1.333
22	N.	T. S. & J. D. Negus	1583	+0.381	+0.377	+0.316	+0.316	+0.371	+0.310
23	N.	T. S. & J. D. Degus	1452	+1.203	+1.270	+1.030	+1.566	+1.550	+1.453
24	Bo.	Barraud	1509	—0.154	—0.266	—0.327	—0.256	—0.271	—0.404

TABLE B.—*Record of Trial of Repaired Chronometers, 1888 January–July—Continued*

Relative number	Repaired by	Time {		May 18 to May 25	May 25 to June 1	June 1 to June 8	June 8 to June 15	June 15 to June 22	June 22 to June 29
		Temperature, Fahrenheit		67°.66	75°.18	73°.15	75°.53	82°.09	83°.56
		Relative humidity, per cent		62.8	70.1	66.6	68.0	66.7	66.8
		<i>Chronometer maker</i>	<i>No.</i>						
1	N.	T. S. & J. D. Negus	1283	—0.730	—0.819	—0.779	—0.740	—1.137	—1.419
2	N.	T. S. & J. D. Negus	1343	—0.837	—0.890	—1.064	—1.133	—1.351	—1.347
3	Bl.	John Hutton	318	+0.734	+0.789	+0.757	+0.689	+0.184	—0.026
4	N.	T. S. & J. D. Negus	1345	+1.270	+1.396	+1.364	+1.439	+1.113	+1.048
5	N.	T. S. & J. D. Negus	1308	—2.516	—2.497	—2.564	—2.526	—2.709	—2.919
6	N.	T. S. & J. D. Negus	1273	—0.301	—0.819	—0.707	—0.847	—1.459	—1.704
7	N.	T. S. & J. D. Negus	863	+0.913	+0.181	+0.186	+0.046	—0.530	—0.633
8	N.	T. S. & J. D. Negus	1245	+1.234	+1.289	+1.186	+1.153	+0.434	+0.510
9	N.	T. S. & J. D. Negus	1298	+0.091	—0.140	—0.033	+0.010	—0.459	—0.669
10	N.	T. S. & J. D. Negus	1220	+0.234	—0.033	+0.079	+0.081	—0.387	—0.633
11	N.	T. S. & J. D. Negus	1259	—0.909	—1.247	—1.064	—1.204	—1.566	—1.847
12	Bl.	John Hutton	352	—1.087	—1.676	—1.636	—1.526	—1.923	—2.133
13	Bl.	John Hutton	225	+1.127	+1.181	+1.079	+1.189	+0.934	+0.689
14	N.	T. S. & J. D. Negus	1115	+0.377	+0.039	+0.114	—0.026	—0.744	—1.097
15	Bl.	John Bliss & Co	2484	+2.520	+2.646	+2.686	+2.903	+2.399	+2.189
16	N.	T. S. & J. D. Negus	1448	+0.377	+0.217	+0.293	+0.260	—0.244	—0.561
17	N.	T. S. & J. D. Negus	740	—1.694	—1.854	—1.779	—1.883	—2.494	—2.847
18	N.	T. S. & J. D. Negus	1319	+0.413	+0.324	+0.293	+0.296	—0.101	—0.454
19	Bo.	John Munroe	275	—1.516	—1.497	—1.529	—1.419	—1.494	—1.561
20	Bl.	John Bliss & Co	2768	—1.337	—0.997	—1.243	—1.204	—1.030	—1.240
21	Bo.	Barraud	$\frac{2}{930}$	—0.944	—1.747	—1.636	—1.669	—2.244	—2.526
22	N.	T. S. & J. D. Negus	1583	+0.449	+0.431	—0.100	—0.061	—0.673	—0.954
23	N.	T. S. & J. D. Negus	1452	+1.591	+1.503	+1.507	+1.367	+0.863	+0.430
24	Bo.	Barraud	1509	—0.266	—0.747	—0.421	—0.490	—1.209	—1.454

TABLE B.—*Record of Trial of Repaired Chronometers, 1888 January–July—Continued*

Relative number	Repaired by	Time		June 29 to July 6	Tempera- ture of compensa- tion	Tempera- ture constant	First trial number	Final trial number
		Temperature, Fahrenheit		74°.95				
		Relative humidity, per cent		62.0				
		<i>Chronometer maker</i>	<i>No.</i>	<i>s</i>	<i>o</i>	<i>s</i>		
1	N.	T. S. & J. D. Negus	1283	−0.724	69.310	−0.00302	10.6997	11.2926
2	N.	T. S. & J. D. Negus	1343	−1.010	71.028	−0.00318	12.9750	13.7671
3	Bl.	John Hutton	318	+0.240	68.332	−0.00250	8.8287	13.8912
4	N.	T. S. & J. D. Negus	1345	+1.204	73.143	−0.00294	12.5423	14.1299
5	N.	T. S. & J. D. Negus	1308	−2.689	70.749	−0.00277	12.3224	14.9145
6	N.	T. S. & J. D. Negus	1273	−1.010	65.265	−0.00313	13.8447	15.2608
7	N.	T. S. & J. D. Negus	863	−0.010	67.464	−0.00246	8.4756	15.5512
8	N.	T. S. & J. D. Negus	1245	+1.062	69.612	−0.00313	12.1875	16.2679
9	N.	T. S. & J. D. Negus	1298	−0.153	68.518	−0.00322	12.2240	16.7609
10	N.	T. S. & J. D. Negus	1220	−0.153	70.410	−0.00365	16.7511	17.6160
11	N.	T. S. & J. D. Negus	1259	−1.224	67.302	−0.00341	16.9059	17.9059
12	Bl.	John Hutton	352	−1.474	66.250	−0.00341	15.2604	18.0160
13	Bl.	John Hutton	225	+0.847	75.241	−0.00329	17.5206	18.4615
14	N.	T. S. & J. D. Negus	1115	−0.260	64.353	−0.00306	16.6490	20.3739
15	Bl.	John Bliss & Co	2484	+2.704	71.518	−0.00334	19.3613	20.6609
16	N.	T. S. & J. D. Negus	1448	+0.240	62.985	−0.00309	19.9914	21.4555
17	N.	T. S. & J. D. Negus	740	−2.117	63.423	−0.00357	19.6642	21.5138
18	N.	T. S. & J. D. Negus	1319	+0.061	66.546	−0.00301	20.5077	22.2238
19	Bo.	John Munroe	275	−1.510	78.709	−0.00171	20.6647	23.1928
20	Bl.	John Bliss & Co	2768	−1.224	88.845	−0.00123	18.5050	25.4746
21	Bo.	Barraud	$\frac{2}{930}$	−1.867	67.520	−0.00492	34.9219	38.0548
22	N.	T. S. & J. D. Negus	1583	−0.117	65.135	−0.00373	36.0753	39.7617
23	N.	T. S. & J. D. Negus	1452	+0.704	70.073	−0.00413	53.3545	55.6045
24	Bo.	Barraud	1509	−0.617	64.560	−0.00361	127.5806	128.5215

REPORT OF COMMANDER ALLAN D. BROWN

UNITED STATES NAVAL OBSERVATORY

Washington, October 1, 1888.

SIR: The work of the division of verification of instruments was carried on by Ensign CLEMENTS, under my general supervision, until the 1st of July; since that date Mr. CLEMENTS has been absent in attendance on the Cincinnati Exposition.

Class A: Sextants and Octants.—There have been received for examination, prior to repairs, 20 sextants; of these 4 have been condemned. There were on hand at date of last report 32 sextants; of these, 15 have been issued to ships in commission, and 2 sent to the Cincinnati Exposition; 16 have been repaired, but all have not been critically examined for errors of eccentricity. The total number on hand is 31.

Class B: Thermometers.—At the request of the Supervising Surgeon-General of the Marine-Hospital Service, 109 clinical thermometers were examined and duly returned with a certificate attached to each. Four were broken and 13 were found to be unreliable, showing a decided improvement over those examined for the same service last year.

A Draper recording thermometer was also received from the agents in this city and placed under comparison. The recording apparatus worked well, but the results of the trial showed that the thermometer did not respond quickly to atmospheric changes, and it can not be regarded as a reliable instrument for use in the service.

Class C: Spyglasses.—Twenty-five spyglasses, by ELLIOTT BROS., were received early in the year and duly examined. They were found to be superior to those previously received from the same firm and have been issued for service. Two other glasses (one by AVIZARD, of Paris, presented to the observatory by the manufacturer through Lieutenant WINTERHALTER) have also been examined. The Avizard glass, upon comparison with No. 16 Elliott (retained as a standard), showed optical superiority, and it has been, by the Bureau's direction, made the standard to which in future the optical performance of glasses must attain.

Class D: Station Pointers.—No instruments of this class have been examined.

Class E: Clinometers.—One Evelyn patent ship clinometer has been presented to the Observatory by Lieutenant WINTERHALTER, to whom it was presented by the inventor.

Class F: Barometers.—No instruments of this class have been examined.

Class G: Binoculars.—Twenty-eight pairs of binocular glasses have been submitted for examination; of these, 4 by STEINHEIL and 2 by AVIZARD (purchased by the Bureau's order by Lieutenant WINTERHALTER) have been accepted. One "standard" and one "ordinary" by BARDOU have also been accepted. Of the others examined, none have been found fully equal to the wants of the service. As one of the results of the examination, it was ascertained that glasses manufactured in Europe and imported into this country have too great a distance between the axes; from which it would appear that the pupils of the eyes of Americans are nearer together than those of Europeans, if the glasses are made with any view to having this distance correct. I am unofficially informed that the same result has been reached by the Signal Service in their search for binoculars. In view of this fact, it was deemed best to recommend

the use of a folding frame, by which the distance between the axes of the tubes can be changed from $2\frac{1}{8}$ to $2\frac{3}{4}$ inches to suit individual cases. A scheme for a "standard" glass was devised and forwarded to the Bureau, where it was approved, and 3 glasses were ordered to be made in accordance with the specifications laid down. One of these (referred to above as the "standard" by BARDOU) has been received, examined, and accepted. There were some slight defects in the manufacture, which will undoubtedly be remedied in the next one made; this, together with one by another maker, is promised for a near date. The specifications call for an object-glass of but 1.5 inches in diameter and 5.5 inches focal length; the oculars are 4 in number, set in a revolving disk, giving powers from 3 to 6, making the glass suitable for both night and day use. The weight of the instrument is but $20\frac{1}{2}$ ounces, being 13 ounces less than that of the "ordinary" pattern. It is believed that hereafter the service will be supplied with an excellent glass at no great expense.

RECAPITULATION

The total number of instruments examined is as follows:

Class A. Sextants.....	20
Class B. Thermometers	110
Class C. Spyglasses	27
Class D. Station pointers	0
Class E. Clinometers	1
Class F. Barometers	0
Class G. Binoculars	28
	186

In addition to the above, a reflecting circle, patented by Capt. CHARLES HENRY TOWNSHEND, of New Haven, Conn., was examined by a board consisting of Lieut. WINTERHALTER, Ensign CLEMENTS, and myself. It was found to possess many advantages for use in hydrographic work, and recommended as a valuable addition to the outfit of a vessel.

Very respectfully,

ALLAN D. BROWN

Commander, U. S. Navy, Assistant Superintendent.

The SUPERINTENDENT, U. S. NAVAL OBSERVATORY.

REPORT OF PROF. WILLIAM HARKNESS, OF THE TRANSIT OF VENUS COMMISSION

UNITED STATES NAVAL OBSERVATORY

Washington, October 11, 1888.

SIR: I have the honor to submit the following report of the work done during the past year, under my supervision, for the Transit of Venus Commission:

The assistants employed at the beginning of the year were Messrs. A. S. FLINT and H. P. TUTTLE. Mr. TUTTLE left the service of the Commission on July 31, and since that time Mr. FLINT has been the only computer employed.

The work accomplished by Messrs. FLINT, TUTTLE, and myself may be summarized as follows :

The observations made at the Lick Observatory for determining local time, azimuth, and level of the axis of the photoheliograph, and the interval between the objective and reticule plate of that instrument, were received last December and were reduced at once. The reduction and discussion of the experiments to determine the radii of curvature of the heliostat mirrors, mentioned in last year's report, have been completed. Additional measurements of the thicknesses of all the reticule plates have been made; their indexes of refraction have been computed from measurements of the linear displacements of small pencils of light passing obliquely through the plates; and the optical thicknesses of all the reticule plates have been deduced, both from the indexes of refraction and from direct measurements effected by focusing a compound microscope alternately through air and through the reticule plates. The focal distances and positions of the principal points have been computed, from the experiments made in 1884, for all the photographic objectives and also for each of their component lenses. The measuring rods belonging to nine of the 40-foot photoheliographs have been very carefully compared with each other, and the length of the 10-foot measuring rod which was used in connection with the New Haven photographs has been accurately determined at the office of weights and measures, under the direction of the Superintendent of the U. S. Coast and Geodetic Survey.

The computations of the refractions at Auckland, New Zealand, the Lick Observatory, and New Haven, Conn., have been completed, and the differential refractions of Venus relatively to the Sun's center have been computed, both in position angle and distance, for all the stations. The latter work involved the formation of new tables, those used in connection with the 1874 transit being found inadequate. The coefficients of the unknown quantities in the observation equations for determining the solar parallax and the errors of the tables of Venus have been interpolated for Wellington, South Africa; Santa Cruz, Patagonia; Auckland, New Zealand; Princeton, N. J.; the Lick Observatory, California; New Haven, Conn., and the products of these coefficients required for forming the normal equations have been interpolated for Santa Cruz, Santiago, Auckland, Princeton, and New Haven. All the other stations were computed last year.

The method employed in the formation of the absolute terms of the observation equations was as follows: (1) The distances measured upon the photographs between the centers of the Sun and Venus were converted into arc without the application of any corrections whatever, and the position angles of Venus relatively to the Sun's center and the plumb line were corrected only for such small errors as arose from accidental want of coincidence between the center of the Sun's image and the center of the reticule plate. (2) From the positions of Venus and the Sun given in the American Ephemeris, combined with the known hour angles and refractions, tables were computed for each station, giving for every minute of time the theoretical position angles and distances of Venus relatively to the Sun's center upon the photographs. (3) The latter position angles and distances were interpolated to the times of the photographs, and the differences between them and the values measured from the photographs gave at once the absolute terms of the observation equations. By this process the risk of error was reduced to a minimum. It may be well to explain

that for the computation of the differential refractions used in the tables just described, a pretty exact knowledge of the errors of the tables of Venus was necessary, and that knowledge was obtained by a preliminary solution of the equations yielded by thirty-three photographs, distributed among ten of the stations. Advantage was taken of the knowledge thus acquired to make the absolute terms of the observation equations as small as possible.

The distance equations have been formed from all the photographs, their number and distribution being as follows:

Washington	49	Auckland	51
Cedar Keys	165	Princeton	162
San Antonio	121	Lick Observatory	123
Cerro Roblero	216	New Haven	86
Wellington	180		
Santa Cruz	211	Total	1,561
Santiago	197		

As the New Haven photoheliograph was of an entirely different kind from those used at the other stations, the New Haven equations have been temporarily laid aside for further discussion. The solution of the 1,475 equations, obtained from negatives made with horizontal photoheliographs of about 40 feet focus, has given

$$\begin{aligned}\pi &= 8.847'' \pm 0.012'' \\ \delta A &= + 2.893 \\ \delta D &= + 1.254\end{aligned}$$

where π is the solar parallax and δA and δD are, respectively, the corrections to the right ascensions and declinations of Venus given by HILL's tables of that planet, it being assumed that HANSEN's tables of the Sun are correct. The corresponding mean distance from the earth to the Sun is 92,385,000 miles, with a probable error of only 125,000 miles. The probable error of a distance between the centers of the Sun and Venus obtained from the measurement of a single photograph is $\pm 0.715''$.

It is expected that the formation of the normal equations from the position angles will be completed in about a month, and it may reasonably be anticipated that when the results from them are combined with those from the distances the probable error of the parallax will be somewhat diminished.

Very respectfully,

WM. HARKNESS,
Professor of Mathematics, U. S. Navy,
of Executive Committee of Transit of Venus Commission.

Capt. R. L. PHYTHIAN, U. S. Navy,
Superintendent of Naval Observatory,
President of Transit of Venus Commission.

LETTER FROM LIEUT. A. G. WINTERHALTER

UNITED STATES NAVAL OBSERVATORY

Washington, October 9, 1888.

SIR: I had the honor of reporting my return to the United States from Europe by letter to the Department, dated New York, November 25, 1887, and in person to the Superintendent on November 29.

During my absence, in addition to the cities mentioned in the last annual report of the Superintendent, I visited, under orders of the Department, observatories and establishments of a scientific character in the following places: Meudon, France; Greenwich, Richmond, Ealing, Oxford, and Cambridge, England; Leyden, Holland; Düsseldorf, Bonn, Strassburg, Berlin, Potsdam, Dresden, Leipsic, and Munich, Germany; and Vienna, Austria. It is a duty to say that I was everywhere cordially welcomed as the representative of the Observatory. I trust I may be permitted to indulge in the hope that my visits have done good in fostering the kindly relations uniting us to European astronomical institutions. The details of my proceedings are given in the full report which is now in preparation and which I shall have the honor to submit at an early date.

For the numerous courtesies of which I was the recipient, I beg leave in this manner to present my earnest thanks to those with whose acquaintance I was favored.

I was the bearer of sundry plans, drawings, sketches, and photographs, 65 in number, which were at various times presented through me to the Observatory, as also 134 books, pamphlets, and catalogues donated to the library; a list of these presents I shall include in my report.

The following instruments were brought to the Observatory:

One ship's clinometer, presented to me by Col. G. P. EVELYN and by me donated to the Observatory.

One Evelyn patent bubble-horizon, purchased and tested at sea by order of the Bureau of Navigation.

One sextant-mirror testing apparatus, by G. HECHELMANN, Hamburg; purchased by order of the Superintendent.

One pair of high-power binoculars, by MM. R. & C. AVIZARD, Paris; purchased by order of the Bureau of Navigation.

One pair of low-power binoculars, by MM. R. & C. AVIZARD, Paris; purchased by order of the Bureau of Navigation.

One marine spyglass, presented to the Observatory by MM. R. & C. AVIZARD, Paris.

One pair of high-power binoculars, by HH. C. A. STEINHEIL SÖHNE, Munich; submitted for examination and since purchased for trial in the service.

One pair of low-power binoculars, by HH. C. A. STEINHEIL SÖHNE, Munich; submitted for examination and since purchased for trial in the service.

One marine spyglass, by HH. C. A. STEINHEIL SÖHNE, Munich; submitted for examination; since returned.

One Jena-glass telescope, aperture 36 Par. lines, with a number of eyepieces of a variety of constructions, by HH. C. A. STEINHEIL SÖHNE, Munich; on trial.

Also, one box of pieces of JENA optical glass, presented by Dr. ADOLPH STEINHEIL.

One sextant with "gyroscope-collimator" and attachments, by M. A. HURLIMANN, of Paris, the invention of Capt. G. FLEURIAIS, French Navy; purchased and tested at sea by order of the Bureau of Navigation.

During the month of December, 1887, I was engaged principally in making the official reports incident to my return and in drawing up the reports on such of the instruments named as had been tested by me. During July and August, 1888, I was employed in preparing the illustrative and photographic exhibit of the Observatory for the Cincinnati Exposition, while during the month of September I had miscellaneous work. During the remaining six months I have been at work by your order in preparing a report on the results of my observation while in Europe, including an account of the International Astrophotographic Congress, held in Paris, April, 1887. The latter, which forms Part I of the report, comprises 166 manuscript pages and is now in the hands of the Public Printer.

In this connection I beg leave to recommend to your consideration the urgency of a provision to enable the Observatory to do the work which will fall to its share in charting the sky by photographic processes. Already foreign Governments have been responding liberally with the necessary funds to allow their observatories to take part in the concerted operations: Germany, England, Brazil, Chile, Spain, Mexico, and the Argentine Republic have each one instrument in process of construction, Australia has two photographic telescopes under way, while France has one completed at Paris and three others in the hands of a constructor. Besides, according to my information, instruments of the character prescribed by the Congress will, without much doubt, be also built for other observatories in England, Denmark, Austria, and Russia. Only one of the thirteen instruments whose construction is assured has been provided by private means, and that for an established university observatory. The character and extent of the projected work will exclude the coöperation of private observatories. It is respectfully submitted that the United States, "the home of astronomical photography," is likely to be left without representation in this great international undertaking, should the Naval Observatory not be provided with means for doing the share which will naturally be allotted to it.

Very respectfully, your obedient servant,

A. G. WINTERHALTER
Lieutenant, U. S. Navy.

The SUPERINTENDENT, NAVAL OBSERVATORY
Washington.

ADDENDUM TO THE REPORT OF THE SUPERINTENDENT

CINCINNATI EXPOSITION

UNITED STATES NAVAL OBSERVATORY

Washington, October 30, 1888.

SIR: I have the honor to inclose the reports of Commander A. D. BROWN, Lieut. A. G. WINTERHALTER, and Ensign A. B. CLEMENTS on the Observatory exhibit at the Centennial Exposition of the Ohio Valley and Central States, held at Cincinnati, Ohio, with the suggestion that they be appended to the annual report of the Superintendent of the Observatory.

The thanks of the Observatory are due to Mr. T. W. SMILLIE, of the National Museum, for valuable assistance in preparing the photographic exhibit.

Commander BROWN, Lieutenant WINTERHALTER, Ensign CLEMENTS, and Mr. GARDNER performed their respective duties in connection with the preparation of the exhibit very efficiently. Through their efforts the principal parts of it were in place at the opening of the Exposition, notwithstanding the late date at which the appropriation became available.

Very respectfully,

R. L. PHYTHIAN

Captain, United States Navy, Superintendent.

The CHIEF OF THE BUREAU OF NAVIGATION

Navy Department.

REPORT OF COMMANDER ALLAN D. BROWN

UNITED STATES NAVAL OBSERVATORY

Washington, October 29, 1888.

SIR: In compliance with your directions, I have the honor to submit an account of the Observatory exhibit at the Cincinnati Exposition.

As soon as the appropriation became available, the preparations for shipment began. The preparation of the photographic portion of the exhibit was intrusted to Lieut. A. G. WINTERHALTER, who devoted much time and attention to this duty. The result of his labor was a series of photographs of the Observatory, instruments, etc., much more complete than the Observatory has ever before possessed. The report made by him gives a list of the portion of the exhibit so prepared.

The time-service exhibit was a complete representation of the system pursued in the distribution of time by the Observatory and consisted of—

- (1) Astronomical clock, with transmitting attachment.*
- (2) Chronograph.
- (3) Transit instrument.
- (4) Relays, sounders, repeaters, etc., for distribution of signals in the exhibition building.
- (5) Time-ball.
- (6) Gardner clock to show intercolonial (or sixtieth meridian) time.
- (7) Gardner clock to show eastern (or seventy-fifth meridian) time.
- (8) Gardner clock, showing central (or ninetieth meridian) time.
- (9) Gardner clock, showing mountain (or one hundred and fifth meridian) time.
- (10) Gardner clock, showing Pacific coast (or one hundred and twentieth meridian) time.
- (11) Time-gongs.
- (12) Map showing 30,000 miles of railroads receiving the time-signals from the Observatory.
- (13) Map showing the different divisions of the standard-time system.

In addition to this were three houses of the Transit-of-Venus Commission pattern, containing, respectively, a photoheliograph, an equatorial telescope of 5-inch aperture, and the transit instrument mentioned above. There was also sent for exhibition a magnetometer, with a dip-circle of the Transit-of-Venus Commission pattern.

All the articles mentioned above were shipped from the Observatory by the 30th of June and were at the Exposition building before it was entirely ready for their reception. The packing and work of preparation therefor were done by Mr. WILLIAM F. GARDNER, to whom much credit is due for the promptness with which the work was performed.

Very respectfully,

ALLAN D. BROWN

Commander, U. S. Navy, Assistant Superintendent.

The SUPERINTENDENT, U. S. NAVAL OBSERVATORY.

REPORT OF LIEUT. A. G. WINTERHALTER

UNITED STATES NAVAL OBSERVATORY

Washington, October 9, 1888.

SIR: The illustrative and photographic exhibit of the Observatory at the Centennial Exposition of the Ohio Valley and Central States, held at Cincinnati, Ohio, the preparation of which was by your order intrusted to me, was forwarded to that city in July and August last.

I have the honor to submit herewith a list of frames displayed.

* Property of Seth Thomas Clock Company.

List of Frames Displayed

No.	Size of illustration	Description
	Inches	
1	14 x 46	Drawing: Elevation of main building, New Naval Observatory.
2	14 x 46	Drawing: Section of same.
3	16½ x 41	Drawing: The new great dome.
4	22 x 28	Photograph: Time-ball station at Telegraph Hill, San Francisco.
5	22 x 48	Photographs: Curves of declination, horizontal and vertical forces, typical of ordinary, moderately disturbed, and greatly disturbed conditions of terrestrial magnetism.
6	27 x 40	Photograph: Group of members of International Astrophotographic Congress, by Nadar, Paris.
7	20 x 26	Three photographs of phases of solar eclipse; three of transit of Venus; taken with the horizontal photo-heliograph.
8	30 x 40	Eight drawings showing the workings of the Gardner Observatory time system, arrangements of transmitting clocks and time-balls.
9	27 x 40	Photographic enlargement: Grounds of New Naval Observatory and location of projected buildings.
10	30 x 40	Photograph: The great dome and prime-vertical room.
11	30 x 40	Photograph: The smaller dome and adjacent parts of main building.
12	30 x 40	Photograph: The Transit-Circle building.
13	30 x 40	Photograph: Compass-house No. 1.
14	30 x 40	Photograph: Compass-house No. 2.
15	34 x 40	Nine views of buildings and instruments.
16	34 x 40	Nine views of buildings and instruments.
17	34 x 40	Nine views of buildings and instruments.
18	16 x 18½	Photograph: Transit instrument and Mural Circle.
19	16 x 18½	Photograph: The Transit Circle.
20	16 x 18½	Photograph: The great equatorial.
21	16 x 18½	Photograph: The 9.6-inch Equatorial.
22	25 x 28	Drawing of Omega nebula, as seen through the great equatorial.
23	25 x 36	Drawing of Orion nebula, as seen through the great equatorial.
24	30 x 36	Drawing of Saturn, as seen through the great equatorial.
25	17 x 22	Drawing of Ring-Nebula in Lyra, as seen through the great equatorial.
26	30 x 36	Photograph: Solar Eclipse, March 15-16, 1885; diameter of Sun's disk, 26 inches.
27	20 x 26	Drawing: Total eclipse of the Sun, July 29, 1878.

The above illustrations, with few exceptions, were newly made for the purpose in hand. In the execution of several of them I had the efficient and valuable assistance of Mr. T. W. SMILLIE, of the National Museum, freely given in the midst of his own exacting labors, the Secretary of the Smithsonian Institution, Prof. S. P. LANGLEY, having accorded the necessary facilities at the request of the Superintendent.

In response to a letter of Prof. J. BROWN GOODE, assistant secretary in charge of the National Museum, addressed to the Superintendent, a number of photographs were furnished that institution, showing the uses of photography in representing lunar, solar, and stellar phenomena, and in recording changes in the Earth's magnetic forces and including views of instruments used for such purposes. Copies of these, I am

informed, were exhibited at Cincinnati, and on their return to Washington will form part of an interesting exposition of the history of photography prepared for the Museum by Mr. SMILLIE.

Very respectfully, your obedient servant,

A. G. WINTERHALTER
Lieutenant, U. S. Navy.

The SUPERINTENDENT, U. S. NAVAL OBSERVATORY
Washington.

REPORT OF ENSIGN A. B. CLEMENTS

UNITED STATES NAVAL OBSERVATORY
Washington, October 29, 1888.

SIR: I have the honor to submit the following statement concerning the exhibit of the Naval Observatory at the Centennial Exposition of the Ohio Valley and Central States, held at Cincinnati, Ohio.

I reached Cincinnati June 29, several days before the opening of the exposition, and remained there until detached, October 23.

The space allotted to the exhibit of the Navy Department was the southern part of the east wing of the Park building and the northeastern part of the south wing of the Government annex. Of this the Observatory exhibit was assigned a platform about 6 inches high and some 36 feet long by 12 wide along the northern wall of the annex building, which seemed admirably adapted for the purpose.

The building was not completed until July 2, at which time we began unpacking and placing the exhibit. The time-service exhibit was the first to be placed in position, and was in operation at the time of the opening of the exposition, July 4. Every facility for the receipt of signals and all the assistance in their power was cheerfully given us by the officials of the Western Union Telegraph Company; to Manager Page, of the Cincinnati office, we were specially indebted for valuable aid. A special wire was run from the local office to the Observatory exhibit for the use of the time-service, and was so carefully attended to that no fault occurred in that circuit during the exposition. This line and one of the Observatory time-gongs were used in opening the exposition, signals from Mrs. James K. Polk, at Nashville, Tenn., being struck on the time-gong temporarily placed on the Music Hall stage for that purpose.

The disposition of the exhibit was generally as follows: The sidereal clock, chronograph, Gardner clocks, telegraphic instruments, maps, photographs, drawings, and magnetic instruments were placed on the platform in the naval exhibit. The time-gongs were placed, one near the fountain in the center of Park building, the other over the canal in machinery hall; a third gong, a part of the exhibit of the Ohio State University, was connected with the same circuit and struck by the time signals. The time-ball was placed on a platform 16 feet high and 8 feet square, erected on the tower over the main entrance to the Park building, on Elm street. The observatory

houses, the photoheliograph and heliostat, equatorial, and transit houses, with their instruments set up for use, were placed in the southeast corner of the park, just outside the Government annex.

Five clocks of the Gardner system, showing intercolonial, eastern, central, mountain, and Pacific-coast time, respectively, were kept running continually and were corrected daily by the noon signal. The clocks and time-ball gave no trouble whatever, responding promptly and accurately to every signal. The time signals were received with the greatest regularity; we failed to receive them on only about half a dozen occasions during the 100 days, and only once failed by reason of a fault outside the local line in Washington City.

The observatory houses in the park were open to the public for two hours, from 1 to 3, each afternoon, and the photoheliograph image of the Sun was shown every day on which the Sun was visible. The equatorial house was open on clear nights, and an opportunity to view the heavens through the telescope was afforded many visitors.

I believe the Observatory exhibit was an attractive feature of the Government display, the time-service especially attracting much attention.

Very respectfully, your obedient servant,

A. B. CLEMENTS

Ensign, U. S. Navy.

Capt. R. L. PHYTHIAN, *U. S. Navy*

Superintendent, U. S. Naval Observatory, Washington, D. C.

GENERAL INTRODUCTION

The Observatory, being a naval establishment, is under the general supervision of the Bureau of Navigation of the Navy Department. It was originally built as a depot of charts and instruments for the Navy, and was fully described in a "Report on the Plan and Construction of the Depot of Charts and Instruments, with a description of the instruments," etc., made by Lieut. JAMES M. GILLISS, U. S. N., to the Secretary of the Navy, in February, 1845, and published as Senate Document No. 114, Congress 28: Session 2. A more general description, illustrated by plans and drawings, may be found in the volumes of the Washington Observations for 1845, 1865 and 1874.

Position of the Observatory.—The following clause relating to the meridian of the Observatory is found in the naval appropriation bill passed by Congress September 28, 1850: "The meridian of the Observatory at Washington shall be adopted and used as the American meridian for all astronomical purposes, and the meridian of Greenwich shall be adopted for all nautical purposes."¹ The latitude deduced from observations with the Mural Circle in 1845 and 1846 was $+38^{\circ} 53' 39''.25$;² and that value was used in the reduction of all observations with the Mural Circle down to 1878. The observations made with the same instrument from 1861 to 1864, inclusive, give a latitude $+38^{\circ} 53' 38''.8$,³ which has been used in the reduction of observations with the Transit Circle. The final north-polar-distances of objects observed with the Transit Circle in any year depend upon all the observations of circumpolar stars made during that year.

The longitude and the latitude of the Observatory are reckoned from the center of the old dome, which is built over the center of the main building.

The telegraphic determination of the longitude from Greenwich depends upon the work of the United States Coast and Geodetic Survey.

The result of their latest adjustment⁴ of the system of telegraphic longitudes gives for the central dome—

$$5^{\text{h}} 8^{\text{m}} 12^{\text{s}}.038$$

In interpolating tabular positions of the Moon and planets, the longitude of the Observatory is assumed to be $5^{\text{h}} 8^{\text{m}} 12^{\text{s}}.0$

Relative positions of instruments.—Since the Observatory was built there have been several changes in the positions of its instruments; and, in order to facilitate comparisons of the work done with them at different times, their coördinates, measured

¹ Revised Statutes of the United States, section 435.

² Washington Observations, 1845, Appendix, p. 116.

³ Washington Observations, 1864, Introduction, p. XLIV.

⁴ U. S. Coast and Geodetic Survey: Report, 1884, p. 423.

from the center of the old dome, are given in the following table. The sign + before a coördinate indicates that the instrument is north or west of the center of the dome, and the sign — indicates that it is south or east of that point.

Instruments	Diff. of Latitude		Diff. of Longitude	
	Feet	"	Feet	s .
Transit:				
January, 1845, to September 2, 1864 . .	0.0	0.00	+ 41.0	+ 0.035
Since October 1, 1864	0.0	0.00	— 42.9	— 0.036
Mural Circle:				
January, 1845, to September 15, 1845 . .	0.0	0.00	+ 32.0	+ 0.027
Since October 1, 1845	0.0	0.00	— 33.9	— 0.029
Meridian Circle:				
January, 1845, to August, 1864	0.0	0.00	— 42.9	— 0.036
Prime Vertical Transit:				
Since January, 1845	— 45.4	— 0.45	0.0	0.000
Transit Circle:				
January 1, 1866, to June 5, 1869	0.0	0.00	+ 38.4	+ 0.032
Since October 1, 1869	0.0	0.00	+ 77.8	+ 0.066
26-inch Equatorial (center of dome):				
Since November 15, 1873	— 120.1	— 1.19	0.0	0.000

THE TRANSIT CIRCLE

During the year 1888 the work with the Transit Circle was carried on under the direction of Prof. J. R. EASTMAN, U. S. N.

The assistants were Assistant Astronomers A. N. SKINNER, W. C. WINLOCK, and H. M. PAUL until November. W. M. BROWN, Jr., was employed as a computer throughout the year.

From January 1 to March 19, the regular observations with the Transit Circle were confined to the following classes of objects:

(1) Stars of the American Ephemeris, for the determination of clock corrections, azimuth corrections, and the corrections to the zenith point and the assumed latitude.

(2) Sun, Moon, and Planets.

(3) Stars whose occultations were observed at this Observatory and by the various American parties who observed the Transit of Venus in 1874.

(4) Stars selected for standard stars in the formation of a catalogue from the zone observations made here from 1846 to 1849.

(5) The stars of the British Association Catalogue between $120^{\circ} 0'$ and $131^{\circ} 10'$ north-polar distance that have not been observed here three times in right ascension and declination.

The observations of miscellaneous stars, which had been undertaken for various purposes since the Transit Circle was first mounted, were finished on March 19, 1888, and the instrument was dismantled and put in order. It was remounted early in June with the intention of beginning, as early as practicable, the observations of the stars of the Bonn Durchmusterung contained in the zone lying between 14° and 18° south declination. The instrument was to be devoted also to the observations of the Sun, Moon, and Planets and the necessary standard stars. As the zone observations, forming the larger part of the work, were to be wholly differential, it was decided to make the observed positions of the Sun, Moon, and Planets depend, both in right ascension and declination, upon the places of the standard stars. The zone work was undertaken with the understanding that additional working force was to be furnished.

The Durchmusterung stars were reduced to the epoch of 1889.0 and carefully arranged in convenient zones for observation. Unfortunately, however, no extra observers or computers were obtained, one assistant was detached from the Transit Circle work in November, and the zone observations were postponed.

In 1888, therefore, the Transit Circle work was divided into two distinct parts. From January 1 to March 19 the north-polar distances depend upon zenith-point cor-

rections obtained from observations of the nadir point and of reflected stars. From June 17 to December 31 the north-polar distances depend upon the standard stars.

The methods of reduction will be explained in the proper place in the following pages.

THE OBSERVING ROOM

The interior of the observing room has been fully described in previous volumes

The latitude of the Transit Circle is the same as that of the center of the central dome of the Observatory, but in longitude it is 77.8 feet = $0^{\circ}.066$ west of that point.

DESCRIPTION OF INSTRUMENTS

The Transit Circle.—A detailed description of the Transit Circle, together with an account of the investigation of its constants, may be found in the Washington Observations for 1865. The following condensed description will be sufficient to render intelligible the explanation of the observations and their reduction.

This instrument was made by Pistor & Martins, of Berlin, in 1865. It is of the reversible pattern, and is mounted upon two massive marble piers, with its axis 8 feet 2 inches above the floor. The telescope has a clear aperture of 8.52 inches, and a focal length of 12 feet and 0.7 of an inch. The axis is cast in a single piece, into which the steel pivots, 2.09 inches in diameter and 1.7 inches long, are screwed. The Y's are of gun metal, and the bearing surfaces are 0.28 inch wide. The distance between the centers of the bearing surfaces is 3 feet 9.1 inches. The telescope tube is made in two similar parts, which are bolted to the opposite sides of the cube which forms the central portion of the axis. The cube measures 16.64 inches on the edge.

Two circles, identical in form and size, are attached to the extremities of the axis. Each has ten radial arms, is cast in a single piece weighing about 80 pounds, is 45.3 inches in diameter at the outside edge and 43.4 inches at the graduation. The circle on the clamp end of the axis, known as circle A, has inlaid upon its face two bands of silver, each 0.13 of an inch wide, the inner one of which is graduated to every 2', and the outer one to every 10'. The other, known as circle B, has inlaid upon its face a single band of silver, 0.13 of an inch wide, which is graduated to every 2'. The graduation of each of these circles is numbered, from left to right, from 0° to 360° , and, as they face in opposite directions, when the telescope is moved in zenith distance the reading of one circle increases while that of the other decreases. The circles are attached to the axis in such a manner that they may be adjusted to bring any desired divisions under the microscopes in a given position of the telescope. Each pier carries four micrometer microscopes placed at the extremities of two diameters, which intersect at right angles, and each of which makes an angle of 45° with the vertical. They are attached by means of metal arms, covered with wood, to the brass disk on the face of the pier, which supports the Y's. The microscopes on the western pier are marked I, II, III, IV; those on the eastern pier, V, VI, VII, VIII. The readings of the former diminish and those of the latter increase as the telescope moves from the zenith toward the south. These microscopes magnify about forty-five diameters; one revolution of their screws is equal to $30''$, and their micrometer heads are divided to

0".5. Each microscope micrometer is furnished with two parallel threads about 12' apart, and the reading is made when the image of the division on the limb of the circle appears to be exactly midway between the threads.

In addition to the microscopes already mentioned, each pier carries another, which is employed as a pointer for setting the telescope by means of the coarse graduation on circle A. These microscopes magnify twenty-three diameters, and are placed at the extremities of horizontal radii to the circles; that on the western pier being north and that on the eastern pier south of the axis. The setting microscope in actual use is always the one at the clamp end of the axis.

In the eyepiece of the telescope is a fixed reticule of fifteen vertical and two horizontal threads. The latter have a space of about 8" between them, and are inserted principally to mark the center of the field. The notation, and the approximate equatorial intervals between each vertical thread and the mean of sets B and D, and C₂, C₃, and C₄, are as follows:

TABLE I.—*Approximate Thread Intervals.*

I	^s 36.8	C ₁	^s 4.1	D ₁	^s 8.2
II	24.5	C ₂	2.0	D ₂	9.6
III or B ₁	12.2	IV or C ₃	0.0	V or D ₃	12.3
B ₂	9.7	C ₄	2.0	VI	24.5
B ₃	8.2	C ₅	4.1	VII	35.8

The threads B₁ to B₃ are known as set B, C₁ to C₅ as set C, and D₁ to D₃ as set D. The thread on the western side of the field is always known as I; therefore, when the instrument is reversed the notation of the threads is reversed.

The eyepiece also contains a right-ascension and a zenith-distance micrometer, in each of which the readings increase as the threads move from the micrometer head. The right-ascension micrometer is provided with a single vertical thread, and is employed in determining the collimation constant, and sometimes in observing the transits of close circumpolar stars when clouds prevent observation at the fixed threads. The value of one revolution of the micrometer screw is 1^s.024. The zenith-distance micrometer is furnished with five horizontal threads, two of which were placed about 8" apart at the beginning of 1881, but on May 13 were changed to about 5".5 apart. The center of the space between these threads is regarded as the standard middle thread. The value of one revolution of this micrometer screw is 15".312. Two of the other threads are placed at a distance of about 2' 33" on either side of the middle threads; that nearest the head of the micrometer being called thread A and the other thread B. For observing Mars at the opposition in 1877 a fifth thread, *b*, was inserted beyond B, about 2' 55" from the middle threads, and is still in the same position. In observing southern stars the micrometer head is below the eyepiece if the clamp is west, and above it when the clamp is east. An increase of micrometer reading is subtractive from the reading of circle A, and additive to that of circle B. A self-registering apparatus is attached to the head of the micrometer screw in such a manner as to

enable the observer to obtain a record of at least four bisections without removing the eye from the eyepiece.¹

The illumination of the field of view is so arranged that the threads can be shown either *dark* on a bright field or *bright* on a dark field. In the case of bright-field illumination the color can be varied from deep red to dark blue.

The instrument is provided with five positive eyepieces, magnifying respectively 135, 158, 186, 279, and 395 diameters. That magnifying 186 diameters is the one generally used.

Collimators.—The Transit Circle is provided with two collimators, having object glasses of 35.2 inches focal length, and 2.1 inches clear aperture. The eyepieces have a power of 67. The collimators are mounted on sandstone piers, the one north and the other south of the Transit Circle, and 14.8 feet from the center of the instrument. The field of view of the south collimator, A, contains a vertical thread crossed at its middle point by a horizontal thread. The field of view of collimator B contains a fixed vertical thread, and two intersecting threads, movable by a micrometer screw. Each of the intersecting threads makes an angle of 12° with the vertical. Two levels are provided by which the collimators may be placed horizontal.

Each side of the central cube of the Transit Circle telescope is pierced with a circular opening, 2.3 inches in diameter, which is closed by a brass cap. By removing the caps and setting the telescope vertical the threads of either collimator may be seen from the other.

The standard sidereal clock.—The sidereal clock used in connection with the Transit Circle since the beginning of 1881 is Parkinson & Frodsham No. 611. In order to provide against the effects of sudden changes of temperature, the clock, situated in the room adjoining the observing room on the eastern side, is inclosed in a vault of heavy masonry, lined with tin, and to prevent the works of the clock from rusting the dryness of the air is maintained by keeping a fire in the clock room throughout the year. The clock has a mercurial pendulum, and the connection with the chronograph and with the galvanic system of the Observatory is effected in the usual way, by means of a platinum point attached to the pendulum rod, about 23 inches above the lower end of the pendulum, and a small globule of mercury. The mercury is so placed on a metallic support that at each oscillation of the pendulum, and at the middle of its arc, the platinum point lightly touches the mercury and closes the circuit.

The rate of the clock is controlled by means of small weights, which can be placed on the top of the pendulum bob.

The counting clock.—This clock is attached to a brick pier near the eastern wall of the observing room. It was made by Parkinson & Frodsham, of London, and has a mercurial pendulum. Its rate is controlled by means of small weights placed on the top of the jar of mercury, and it is kept within less than half a second of the standard sidereal clock.

This clock contains a delicate spring, furnished with a platinum point resting upon a small plate of the same metal, the whole so arranged that at the beginning of each minute an arm attached to the arbor of the second hand raises the spring and

¹ See *Astronomische Nachrichten*, No. 1493, p. 77.

separates the point from the plate for nearly one second. Wires are attached to this apparatus, so that if desired it may be included in the same circuit with the standard sidereal clock, when, if the beats of the two clocks are nearly in coincidence, the mark for the sixtieth second of the standard clock will be omitted on the chronograph.

The chronograph.—This instrument is mounted on a wooden stand, usually placed near the eastern wall of the observing room, but from November to April it is transferred to the clock room. It is a modified form of the Hipp chronograph, in which regularity of motion in the train is secured by a spring making 132 vibrations a second. The barrel of the chronograph is 6.37 inches in diameter, 13.5 inches long, and revolves once in a minute. A sheet of paper fastened on the chronograph barrel by thin metallic springs is sufficient to contain the record of two hours' continuous work, and the train requires winding only when the paper is changed. The clock signals and those of the observer are recorded by a single pen. The armature of the magnet which controls the pen is provided with repeating points for use in sending signals to distant stations when determining differences of longitude by telegraph. The pen carriage is moved forward by an endless screw, but may be lifted from its bearings and moved backward or forward, so that the pen may be placed upon any part of the chronograph sheet. The chronograph stops when the sheet is full. The record is made on paper of the quality of ordinary writing paper with common writing ink.

The pen is of glass, and the lower part of the bulb is drawn out to a fine capillary tube, so that, when the ink is placed in the bulb and the pen allowed to rest its whole weight on the paper, it produces a fine sharp line as the barrel revolves.

The barometer and thermometers.—The barometer is of the cistern form, and is suspended on the eastern wall of the observing room, near its northeastern corner. This instrument has a tube about 0.3 of an inch in diameter, and the graduation may be read by means of a vernier to 0.01 of an inch. The *attached* thermometer has a Fahrenheit scale graduated from $+2^{\circ}$ to $+125^{\circ}$. The *external* thermometer has a Fahrenheit scale, and is graduated from -36° to $+157^{\circ}$. It is suspended 1 foot outside the north front of the observing room, 13.5 feet above the grass, and is protected from radiation by a shield formed by a double roof of boards, the upper one covered with tin painted white, and the three sides are of wooden, double louver work. The *upper* thermometer is suspended above the nadir stage, with the bulb nearly as high as the object glass when the telescope is pointed toward the zenith. It has a Fahrenheit scale graduated from $+4^{\circ}$ to $+144^{\circ}$.

Personal equation apparatus.—The apparatus for determining the personal error of an observer in noting the time of the transits of stars is the one described in the introduction to the Transit Circle work in the volume for 1875.

Reflection apparatus.—The apparatus described in the Introduction to the Transit Circle work in the volumes for 1875 and 1876 was used during 1888 for observing stars by reflection.

In practice the rule generally followed was to make the bisections for the direct and reflected observations symmetrical with regard to the central thread, in most cases for reflection observations at threads I and II, and for direct observations at VI and VII.

OBSERVATIONS AND REDUCTIONS

Position of axis.—The system of observations with this instrument is based on the plan of reversing the axis usually at the beginning of each year, and at the same time shifting the position of circle B on the axis, so that the north-polar distances of the same object will depend on different circle divisions in different years. At the beginning of 1888 the axis was not reversed and the clamp end of the axis was west until the instrument was dismantled after March 19. After June 17 the clamp end of the axis was east.

Arrangement of work.—During most of the year 1888 there were four observers attached to the Transit Circle, who, with the assistance of one computer, made all the observations and computations. As a rule, each observer is held responsible for all the observations to be made during an “observing day” of twenty-four hours, beginning at 9 a. m.

The usual observing hours are from 9 a. m. to 3 p. m. and from 8 p. m. to an hour late enough to observe whatever small planets may be near opposition. It is a rule to observe the Moon whenever it can be seen at time of transit, except between 1 and 6 a. m.; and on Sundays the only observations regularly made are those of the Moon and of stars necessary for the determination of clock correction and instrumental constants.

Generally, in clear weather, it is designed to observe a group of at least three “time stars” in the forenoon and three in the afternoon, and also a similar number near the beginning and the end of the work at night.

The azimuth constant is considered invariable throughout the “observing day,” but the collimation and level constants and the zenith-point corrections are generally determined at about the middle of the observations for each day and each night. If the observations are prolonged to a very late hour at night these constants are generally determined twice.

The number of observations to be obtained in an “observing day” has not been fixed, for, with rare exceptions, the zeal of the observers leaves no necessity for fixing a minimum limit.

Method of observing.—A galvanic current, closed by the standard sidereal clock, controls the chronograph pen, and all observations of time are made by the aid of its recorded beats. Therefore, the first duty of the observer is to put the counting clock in coincidence with the standard. Then the counting clock serves to indicate the second corresponding to each beat of the chronograph pen, and when included in the clock circuit it also indicates the beginning of each minute on the chronograph by causing the pen to omit the mark corresponding to the sixtieth second.

The general method adopted in using the Transit Circle is to bring the proper divisions of circle B near the zeros of its micrometer microscopes, and then to measure with the zenith-distance micrometer of the telescope the distance between its zero point and the image of the object observed. The subdivision of the intervals between consecutive divisions on circle B is thus thrown entirely on the zenith-distance micrometer, and as the arc measured by the micrometer microscopes rarely exceeds 10'' their

errors of run are neglected. The graduation of circle B is considered better than that of circle A, and is consequently employed in all measures of zenith distance. Circle A is used only as a setting circle, to indicate the degrees and minutes of zenith distances, and its position on the axis is never changed. If a collimating eyepiece is attached to the telescope, the zenith-distance micrometer set at 35 revolutions, and the instrument turned until the central micrometer wires coincide with their own images reflected from the surface of mercury, the reading of the horizontal microscope of circle A will be $179^{\circ} 56'$, and some divisions of circle B will be found very nearly under the zeros of its micrometer microscopes.

Let

R denote the reading of the horizontal microscope of circle A when the telescope points to the zenith;

φ , the latitude of the Transit Circle;

δ , the declination of the object;

r , the refraction of the object.

Then, when the clamp is west, the telescope must be set so that the reading of the horizontal microscope of circle A will be,

For a direct observation - - - - - $R - \varphi + \delta \pm r$

For a reflection observation - - - - - $180^{\circ} + R + \varphi - \delta \mp r$

If the clamp is east the reading will be,

For a direct observation - - - - - $R + \varphi - \delta \mp r$

For a reflection observation - - - - - $180^{\circ} + R - \varphi + \delta \pm r$

If the true value of φ were substituted in these expressions, whenever the computed setting was not exactly an even minute, it would be necessary to set on the *nearest* even minute. In practice, it is found much more convenient to set on the *next less* even minute; and, in order to avoid measuring more than half the distance between two consecutive divisions on the circle with the zenith-distance micrometer, a fictitious value of φ is used. The fictitious latitude is $\varphi + 1'$ for a *direct* observation with clamp east, and a *reflection* observation with clamp west; and $\varphi - 1'$ for a *direct* observation with clamp west, and a *reflection* observation with clamp east. The formulæ actually employed for computing the settings are, therefore,

For a direct observation, clamp east - - - $38^{\circ} 50'.6 - \delta \mp r$

For a reflection observation, clamp east - - $141^{\circ} 3'.4 + \delta \pm r$

For a direct observation, clamp west - - - $321^{\circ} 3'.4 + \delta \pm r$

For a reflection observation, clamp west - - $218^{\circ} 50'.6 - \delta \mp r$

In these formulæ r is taken with the upper sign for an object south, and with the lower sign for an object north, of the zenith. For the Moon r is made equal to the sum of the refraction and the parallax. In observing faint objects it is often desirable to know the approximate reading of the zenith-distance micrometer for the point at which

the object will enter the field of view. In both positions of the clamp the reading is computed from the formula,

$$\text{Micrometer reading} = 39 \text{ revolutions} - \frac{\varepsilon}{R}$$

where ε is the difference between the computed setting and the next less even minute, and R is the value of one revolution of the micrometer screw.

The adopted mode of observing is to move the zenith-distance micrometer until the image of the star or the limb of the Sun, Moon, or planet bisects the space between the two middle threads of the micrometer, and this operation is called, in this Introduction, briefly, *bisecting* the object. Very faint objects are bisected with one of the single threads A or B. These threads are also used in order to avoid moving any thread more than two minutes when observing two or more objects, differing more than two minutes in declination, on the same setting. Bisections are made always by moving the micrometer threads *from* the head. The microscope-micrometer threads are always moved *toward* the head. The readings of the zenith-distance micrometer are taken from the self-registering indexes after the completion of each observation.

Three persons are usually employed in making a complete observation of the four limbs of the Sun, though it is sometimes accomplished by two. The setting for the north and south limbs is computed, a pasteboard cap with a circular aperture 3 inches in diameter is put over the object glass, a shade glass is placed on the eyepiece, and the telescope set for the position of the Sun's center. About two minutes before the predicted time of transit of the Sun's center the shutters are opened, and the observer notes the time of transit of the preceding limb over the eleven transit threads in the usual way. The assistant at circle A now sets the telescope for the observation of one of the horizontal limbs, and while the observer is making the bisections at threads I and II, the assistant at circle B reads the four microscopes. This done, the telescope is set for the other limb, the bisections at threads VI and VII are made, while the assistant at circle B again reads the four microscopes. The telescope is then unclamped and moved until the following limb is in the field, when its transit over all the threads is observed. During the observation, the circles are protected from the direct rays of the Sun by the steps and platform used in observing the nadir point.

In observations of the Moon, if the preceding limb is the full one, the settings for the center and for the full horizontal limb are computed and the instrument set for the center, but not clamped. The transit of the preceding limb is then observed, and the observer going to circle A sets the instrument on the full horizontal limb. Returning to the eyepiece, he makes the bisections usually at threads II, III, IV, V, and VI. The observation is completed by reading the microscopes of circle B.

If the following limb is full, the telescope is set for the position of the full horizontal limb, and the microscopes are read before the Moon enters the field. After the bisections are made, the telescope is unclamped and moved till the following limb is in the field, when the transit is observed in the same way as for the preceding limb.

When the larger planets are observed, the bisections of one limb are made at threads I and VII, and of the other at II and VI. The transit of the preceding limb is usually observed at sets B and D, and of the following limb at set C.

Planets which do not present a well-defined disk are observed in the same manner as fixed stars.

The general plan for observing fixed stars is as follows:

(1) If the star is within 5° of the pole, the transit is observed by eye and ear at the threads of set C, and it is bisected at C_1 , C_3 , and C_5 , or sometimes at all the threads of the set.

(2) If the star is situated between 5° and 20° of polar distance, the transits over set C are recorded on the chronograph in the usual way, and it is bisected at any two of the threads B_1 , B_3 , D_1 , D_3 ; preference being given to the combinations B_3 , D_1 , or B_1 , D_3 , which make the observation symmetrical.

(3) If the polar distance of the star exceeds 20° , its transit over the eleven threads is recorded on the chronograph, and the bisections are made at any two of the threads I, II, VI, VII; preference being given to the combinations II, VI, or I, VII. Sometimes bisections are made at each of the threads I, II, VI, VII.

(4) In the case of double stars, the transit of one component is usually observed over sets B and D, and of the other over set C. The bisection of one component is made at threads I and VII, and of the other at threads II and VI.

In observing transits by eye and ear, the beat of the chronograph pen is used and not that of the counting clock.

Thread intervals.—The following thread intervals were determined early in 1877, and have been employed during the year 1888. In 1888 a series of observations were made to check the values determined in 1877, but no appreciable change was detected.

TABLE II.—*Thread intervals for 1888.*

January 1 to March 19			June 17 to December 31		
$B_1 + 12.255$	$C_1 + 4.095$		$B_1 + 12.230$	$C_1 + 4.078$	
$B_2 + 9.642$	$C_2 + 2.051$		$B_2 + 9.681$	$C_2 + 2.035$	
$B_3 + 8.174$	$C_3 - 0.011$	$D_1 - 8.166$	$B_3 + 8.166$	$C_3 + 0.011$	$D_1 - 8.174$
	$C_4 - 2.035$	$D_2 - 9.681$		$C_4 - 2.051$	$D_2 - 9.642$
	$C_5 - 4.078$	$D_3 - 12.230$		$C_5 - 4.095$	$D_3 - 12.255$

In reading all complete observations from the chronograph sheets the records for C_1 and C_5 are omitted, and the remaining nine threads are considered the standard set.

The zenith-distance micrometer screw.—From a series of observations made in 1873, the value of one revolution of the zenith-distance micrometer screw was found to be $15''.312$, and this value has been used in reducing the observations made in 1888.

When the close pair of micrometer threads occupies the center of the space between the fixed horizontal threads, the reading of the micrometer screw is 40 revolutions, and the reading increases as the threads move from the micrometer head.

The right-ascension micrometer screw.—The adopted value of one revolution of this screw is $1''.024$. This value was determined by measuring the intervals between the transit threads which had been determined by the transits of stars near the pole.

Inclination of threads.—The corrections for inclination of micrometer threads used in 1888 are given in the following table :

TABLE III.—*Inclination of threads for 1888.*

From January 1 to March 19					From June 17 to December 31			
Vertical Thread	Correction for Inclination of Double Threads	Correction for Thread A	Correction for Thread B	Correction for Thread <i>b</i>	Correction for Inclination of Double Threads	Correction for Thread A	Correction for Thread B	Correction for Thread <i>b</i>
I	— 0.41	— 2 31.79	+ 2 34.30	+ 2 54.26	— 0.66	+ 2 30.80	— 2 34.84	— 2 56.10
II	.28	31.99	34.10	54.41	.44	31.10	34.59	55.58
III	— .14	32.19	33.89	54.57	— .22	31.40	34.33	55.06
IV	.00	32.39	33.69	54.72	.00	31.70	34.08	54.54
V	+ .14	32.59	33.49	54.87	+ .22	32.00	33.83	54.02
VI	.28	32.79	33.28	55.03	.44	32.30	33.57	53.50
VII	+ 0.41	— 2 32.99	+ 2 33.08	+ 2 55.18	+ 0.66	+ 2 32.60	— 2 33.32	— 2 52.98

The corrections for threads A, B, and *b* in the above table contain, besides the correction for inclination, the reduction to the middle pair of threads.

Collimation constant.—The collimation constant is determined by means of the collimators, without reversing the instrument.

The covers of the opening through the central cube of the telescope are removed and the instrument turned until the horizontal thread in collimator A appears in the field at about 35 revolutions. Then, by means of the screws acting against the Y's of collimator A, its vertical thread is moved until it is seen very near the image of C_3 in the telescope. Three measures of the small distance between C_3 and the image of the vertical thread in the collimator are then made with the right-ascension micrometer.

The telescope is then pointed to the zenith, and the micrometer of collimator B is moved until the intersection of its cross threads is exactly on the image of the vertical thread of collimator A. The telescope is then pointed on collimator B, and four measures made of the distance between C_3 and the intersection of the cross threads.

The telescope is again pointed to the zenith, and the adjustment of the vertical thread of collimator A on the cross threads of collimator B is examined. If it is imperfect, it is readjusted, and another set of measures similar to the first is made. The mean of the first and last sets of measures is taken as the true distance of C_3 from the image of the vertical thread of collimator A. Care is taken to determine the value of c_0 when the temperature is changing very slowly.

In the computation of the constant from these data in 1888,

c_τ = the sum of the collimation constant, at the temperature τ° Fahr., and the constant of diurnal aberration;

c_0 = the sum of the same constants at the temperature 0° Fahr.;

M = the distance, in micrometer revolutions, of the image of the vertical thread of collimator A east of C_3 ;

M' = the distance, in micrometer revolutions, of the image of the intersection of the threads in collimator B *east* of C_3 ;

R = the value, in seconds of time, of one revolution of the micrometer screw = $1^s.024$;

φ = the latitude of the Observatory;

i = the reduction of the position of C_3 to the mean of the set of nine threads.
= $-0^s.011$ from January 1 to March 19; and = $+0.011$ from June 17 to December 31, 1888.

Then if M and M' have been observed at the temperature of τ° Fahr.,

$$c_\tau = \frac{1}{2} (M + M') R - 0^s.021 \cos \varphi - i = 0^s.512 (M + M') - 0^s.021 \cos \varphi - i.$$

In the Transit Circle the collimation varies with the temperature, and from a discussion of many observations, made at widely different temperatures, it has been found that

$$c_0 = c_\tau \mp 0^s.004 \tau$$

where the upper sign is used when the clamp is east, and the lower when it is west.

As the value of c_0 has been found generally to be very steady throughout the year, it is usually determined two or three times a month, and for the final reduction of observations with the Transit Circle, a constant value of c_0 is used during the period that the thread C_3 remains undisturbed. The value used is the mean of all the values determined by observation. The adopted values of c_0 for 1888 will be found at the head of Table A of this Introduction.

From an examination of a large number of observations it was found, as suspected, that the change of error of collimation was not as rapid as the change of temperature, and in 1888, whenever the change of temperature was not excessive during the observing period, the *mean* temperature of the period was used in computing the value of c , used in the reductions and assumed to be constant for the period. If the change of temperature was abnormal, the mean temperatures at the beginning and at the end of the period were used in computing two values of c , and in the reductions the values of c were assumed to vary uniformly with the time. The temperatures used were the readings of the thermometer attached to the barometer and of the thermometer hanging on the nadir stage at the same height as the objective when the telescope pointed to the zenith. For each period the value of c was obtained in 1888 from the formula:

$$c = c_0 \mp 0^s.004 \tau$$

the upper sign is used for clamp west and the lower sign for clamp east; and τ represents the mean temperature for the period.

The level constant.—In 1888 the level constant b was deduced from the following observation:

Employing the eyepiece and apparatus used in making the nadir observation, the distance between c_3 , the middle thread of set C, and its reflected image, was measured with the right-ascension micrometer.

Representing the measured distance by d , and the collimation constant by c , we have

$$b = c \pm \frac{d}{2}$$

the upper sign being used when the reflected image is west and the lower sign when it is east of the thread.

A very careful examination of the pivots with a spherometer caliper in January, 1878, indicates that they are sensibly round and equal in diameter.

The azimuth constant.—The azimuth constant is generally determined from the observed transit of one or more of the “azimuth stars,”—Polaris, δ Ursæ Minoris, γ Cephei, or λ Ursæ Minoris—by means of the formula

$$a = \frac{\alpha - (T + \Delta T + Bb + Cc)}{A}$$

where a , b , and c are the azimuth, level, and collimation constants; A , B , and C the azimuth, level, and collimation factors; α , the adopted right ascension of the star; T , its observed time of transit; and ΔT , the approximate clock correction at T . When the same star is observed, both above and below the pole, on the same observing day, the mean of the constants derived from those observations is adopted for the azimuth constant for that observing day.

If no star is observed above and below the pole, the adopted constant is the mean of the results obtained from such azimuth stars as have been observed.

If from any cause no azimuth stars are observed, the constant is derived from the observed places of all the known stars by the method of least squares.

The zenith point correction from nadir observations.—This constant is determined from observations of the nadir point with a Bohnenberger eyepiece in the following manner:

(1) The telescope is pointed downward over a box of mercury, set so that the circle reading is $179^\circ 56'$, and the four microscopes at circle B are read.

(2) Two readings of the zenith-distance micrometer are then taken by moving the close pair of micrometer threads until the space between them and their images, reflected from the mercury, appears equal to the distance between the two threads, the threads being nearer the head of the micrometer.

(3) Four readings of the micrometer are next made in the same way as before, except that the threads are placed the other side of the images.

(4) Two more readings of the micrometer are then made in the same manner as the first two, and the microscopes at circle B are again read.

The mean of the eight micrometer readings will give the reading for the coincidence of the two threads and their images.

The observations are reduced by means of the formula:

$$\text{Zenith-point correction} = \left\{ \begin{array}{l} 180^\circ + \text{Division correction for circle B} \\ + \text{Correction for flexure of circle B} \\ + \text{Correction for flexure of telescope} \\ - \text{Constant added to reduction to meridian} \end{array} \right\}$$

$$- \left\{ \begin{array}{l} 179^{\circ} 56 \pm 10 \text{ revolutions of micrometer micro-} \\ \text{scopes} \\ \mp \text{ Observed reading of micrometer micro-} \\ \text{scopes} \\ + \text{ Micrometer equivalent corresponding to} \\ \text{the observed reading of the zenith-} \\ \text{distance micrometer} + 0^{\text{r}}.250 \end{array} \right\}$$

The value of the first term in the expression for the zenith-point correction is a constant, and, in 1888, the different terms were obtained as follows:

											°	′	″
Nadir constant is	-	-	-	-	-	-	-	-	-	-	180	0	0.00
Correction for errors of division is												—	0.13
Correction for flexure of circle is	-	-	-	-	-	-						+	0.15
Correction for flexure of telescope is	-	-	-	-	-	-						+	0.29
Constant added to reduction to meridian is	-	-	-									—	1.80
											179	59	58.51

The correction $+0.250$ to the reading of the zenith-distance micrometer is necessary, because the head of that micrometer has four indexes, and the one used in the nadir observation reads 0.250 less than that employed in other observations.

													°	′
For microscope V	-	-	-	-	-	-	-	-	-	-	-	-	188	4
For microscope VI	-	-	-	-	-	-	-	-	-	-	-	-	278	4
For microscope VII	-	-	.	-	-	-	-	-	-	-	-	-	8	4
For microscope VIII	-	-	-	-	-	-	-	-	-	-	-	-	98	4

The microscopes were read both *before* and *after* the nadir observation, and the mean of these readings was adopted as the true reading. As the instrument was not reversed at the end of 1887, and the observations under the present system were continued only until March 19, 1888, the discussion of reflected and nadir observations and the deduced systematic corrections in this volume embrace all the observations from January 1, 1887, to March 19, 1888:

During the year 1887-'88 *thirty* observations, *direct* and *reflected* at the same transit, were made of stars *south* of the zenith and *thirty-three north* of the zenith. The mean of the differences between the zenith-point corrections derived from observations of the nadir and of stars was, for *southern* stars, $\text{Nadir} - \text{Star} = -0''.96$, and for *northern* stars, $\text{Nadir} - \text{Star} = 0''.00$. An examination of these individual values in groups comprising stars between 5° and 15° , 15° and 25° , 25° and 35° , and 35° and 45° Z. D. does not indicate any change in the correction, Nadir — Star, depending on the zenith distance.

Whenever nadir observations alone were made, the unmodified results were used as the zenith-point corrections. When corrections were obtained from both nadir and star observations, or from star observations alone, the values from stars were corrected by the above values of Nadir — Star, and the mean of all corrections obtained during a day or evening was adopted, giving equal weight to each value.

Zenith-point corrections from observations of standard stars.—From June 17 to December 31, 1888, the zenith-point corrections were derived from the observations of standard stars from the American Ephemeris. Before it was decided to postpone the work on the southern zone, several stars from the Berlin Ephemeris, whose apparent places were not given in the American Ephemeris, were placed on the observing list, and had been observed several times. When it was settled that the zone would not be observed in 1888 it was decided to apply the proper corrections in both right ascension and declination to the places of the stars from the Berlin Ephemeris to reduce them to the system of the American Ephemeris, and this course was followed throughout the year. All the standard stars observed during each day and each night were reduced with an assumed zenith point correction to obtain an approximate correction for refraction. This gave a second approximation to the zenith-point correction with which the true refraction correction was computed, after which a comparison of the observed north-polar distances with the Ephemeris places gave a series of zenith-point corrections. The mean of the several corrections for each period was adopted as the zenith-point correction for that epoch. These adopted corrections will be found in the latter part of Table C.

EXPLANATION OF THE PRINTED OBSERVATIONS

In former volumes, from 1866 to 1876, inclusive, it was the custom to print the observations with the Transit Circle in detail, but in the volumes since 1876 it has been deemed advisable, for many reasons, to change the system, and to print only the *results* of the observations and reductions, and this plan has been followed in 1888.

These results will be found on pages B.1–30.

Right ascensions.—The *first* column contains the day of the observation, which begins with the transit of the Sun. It also contains the initial of the observer, as follows:

E.—Professor J. R. EASTMAN, U. S. N.

S.—Assistant Astronomer A. N. SKINNER.

P.—Assistant Astronomer H. M. PAUL.

W.—Assistant Astronomer W. C. WINLOCK.

The *second* column contains the reference number.

The *third* column contains the name of the object. In the case of the Sun, Moon and Planets, the part observed is always specified; I and II indicating respectively the preceding and following limbs; N. and S., the north and south limbs; and C., the center. When only one component of a double star is observed, it is always the brighter of the two, unless otherwise designated.

The *fourth* column contains the observed magnitude.

The *fifth* column contains the number of threads over which transits were observed, and used in the reductions.

The *sixth* column contains the minutes and seconds of the clock time of transit over the "mean thread," whose position is the mean of the standard set of nine threads. When stars are observed over other or less threads than the standard set, the recorded transit over each thread is reduced to the "mean thread" by means of the known thread intervals. In the case of other objects, the reduction of each thread is corrected for the motion of the object during the interval between each thread and the "mean thread."

The *seventh* column contains the sum of the instrumental corrections, or the quantity

$$(Aa + Bb + Cc)$$

where a, b, c are the constants, and A, B, C are the factors for azimuth, level, and collimation.

The formulæ for computing A, B , and C are:

$$A = \sin(\varphi - \delta) \sec \delta = \sin \varphi - \cos \varphi \tan \delta$$

$$B = \cos(\varphi - \delta) \sec \delta = \cos \varphi + \sin \varphi \tan \delta$$

$$C = \sec \delta$$

in which φ is the latitude of the Observatory, and δ is the declination of the object observed.

The reductions of Transit observations with the Transit Circle are made by means of tables giving the values of Aa, Bb , and Cc for each degree of zenith distance, and for each $0^s.01$ of the constants a, b, c , from $0^s.01$ to $0^s.50$. These tables may be found in Appendix I to the Washington Observations for 1872.

A general table of the values of the factors A, B , and C may be found on page XLVII of the Introduction to the Transit Circle in 1873. Observations of the Moon are also corrected for the motion in R. A. during the passage from the mean thread to the true meridian.

Table A, following this Introduction, contains the adopted values of the instrumental constants for all occasions on which observations were made. The first column gives the mean date. The second, third, and fourth columns contain respectively the adopted values of the collimation, level, and azimuth constants. The values of c and

b are taken as constant during each observing period. The value of a is generally assumed to be constant for each observing day. In rare instances, where a decided change is shown, different values are used for the day and for the night.

The *eighth* column contains the *apparent* and the *adopted* clock corrections. The apparent clock corrections are in full-faced type, and are derived, with rare exceptions, from direct observations of stars of the American Ephemeris within 40° of the equator.

The adopted apparent right ascensions of these stars are those of the American Ephemeris for 1888. (See page A.46.)

The adopted clock corrections in the *eighth* column, printed in ordinary type, are derived from the data in Table B.

The principal work of the Transit Circle in 1888 was upon the Sun, Moon, Planets, and miscellaneous stars, and it was deemed unadvisable to attempt the determination of corrections in right ascension to the star places of the American Ephemeris, as was done before 1876. Accordingly, in 1888 only the transits of such stars of the American Ephemeris were observed as were required to determine clock corrections and rates, and instrumental corrections. Whenever possible, at least three stars were observed for clock corrections near the beginning and also near the end of the observing period on each day and each night. The mean of the corrections in each group was assumed to correspond with the mean of the times, and the hourly rate was determined for the period that the clock was in actual use. The corrections and rates are found in Table B, which requires no explanation. By this method the ordinary personal equation of the observer was not involved in 1888.

Special personal equation.—In the Introduction to the Transit Circle work in the volume for 1886, page XLI, is a discussion of the observations made to determine the personal equation of the observers which depended upon observations of the transit of faint stars, especially in a dark field over bright threads. It is unnecessary to repeat that discussion here, but as the corrections resulting from that investigation have been applied to some of the observations in 1888, the values are given below.

The following table exhibits the adopted corrections to be applied to all of Professor EASTMAN'S observations of faint stars in 1888:

TABLE IV.—*Special Personal Equation for Faint Stars.*

Apparent Magnitude	Correction	Apparent Magnitude	Correction	Apparent Magnitude	Correction
8.5 to 8.9	^s —0.06	10.0	^s —0.12	11.1	^s —0.23
9.0	.07	10.1	.12	11.2	.25
9.1	.07	10.2	.13	11.3	.27
9.2	.08	10.3	.13	11.4	.29
9.3	.08	10.4	.14	11.5	.32
9.4	.09	10.5	.15	11.6	.35
9.5	.09	10.6	.16	11.7	.38
9.6	.10	10.7	.17	11.8	.42
9.7	.10	10.8	.18	11.9	.46
9.8	.11	10.9	.19	12.0	—0.51
9.9	—0.11	11.0	—0.21		

For the other observers the following corrections have been used:

Assistant Astronomer SKINNER	-	-	-	-	-	-	-	-	-	^s — 0.07
Assistant Astronomer PAUL	-	-	-	-	-	-	-	-	-	— 0.07
Assistant Astronomer WINLOCK	-	-	-	-	-	-	-	-	-	— 0.07

These corrections, together with those obtained for Professor EASTMAN'S work, were applied in 1888 to the individual observations of the faint miscellaneous stars when the means were taken to obtain the results for the catalogue.

The *twelfth* column contains the apparent right ascension of each object, or the sum of the *sixth*, *seventh*, and *eighth* columns, and in all cases has reference to that part of the object which was actually observed.

The *thirteenth* column contains,

(1) The reduction for all miscellaneous stars to their mean position for the fictitious epoch 1888.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(2) The observed sidereal time of the semidiameter of the Sun, the Moon, or a planet passing the meridian. When only one limb is observed, the quantity is that given in the American Ephemeris. In the case of the Sun, the Ephemeris time has been corrected for the personal equation of the observer, which was determined from all the observations of the year. See Table XIV.

North-polar distance.—The *ninth* column contains the zenith distance *south* of each object observed, as derived from circles A and B. This quantity, when the clamp is *east*, is equal to the reading of the horizontal microscope of circle A, minus the excess of the mean of the readings of the micrometer microscopes of circle B above *ten* revolutions. When the clamp is *west* it is equal to $359^{\circ} 52'$, minus the reading of the horizontal microscope of circle A, plus the excess of the mean of the readings of the micrometer microscopes of circle B above *ten* revolutions.

The *tenth* column contains the sum of the following quantities:

- (1) The micrometer equivalent.
- (2) The reduction to the meridian.
- (3) The correction for inclination of threads and motion of object.
- (4) The correction for the thread employed in the bisections.
- (5) The zenith-point correction.

(1) The micrometer equivalent of the readings of the zenith-distance micrometer if the clamp is east, is

$$2' \ 0''.0 + R (40^r.000 - r)$$

if the clamp is west, it is

$$4' \ 0''.0 - R (40^r.000 - r)$$

In these formulæ r is the mean of the readings of the zenith-distance micrometer, expressed in revolutions; R , the mean value of one revolution between r and 40.0

revolutions, and the numerical term is a constant added to make the zenith-point correction generally positive.

In practice, the micrometer equivalents are taken from a table where the values are tabulated for each 0^r.01 from 24^r.3 to 47^r.8.

Two bisections of each object observed were usually made with the declination micrometer. When, for any reason, any other number of bisections were made, the fact is noted at the foot of the page.

(2) The reduction to the meridian is computed from the formula

$$\begin{aligned}\mu &= 1''.80 - 112.5 \sin 1'' i^2 \tan \delta \\ &= 1''.80 - [6.7367] i^2 \tan \delta\end{aligned}$$

where μ is the reduction to the meridian, in seconds of arc; i , the equatorial interval in seconds of time, between the mean thread and the thread at which the bisection was made; δ , the declination of the object; and $1''.80$ is a constant introduced to make μ generally positive. The values of μ are tabulated for all the vertical threads and for each degree of declination.

Where bisections are made away from the vertical threads, the time of the bisection is noted, and the correction is computed from the formula

$$\mu = 1''.80 - [6.4357] I^2 \sin 2 \delta$$

where I represents the distance of the object from the meridian at the time of bisection, and the other terms are the same as before.

(3) The corrections for inclination of threads, given on pages A.42 and B.3, were derived from a large number of observations at threads I and VII. The correction for motion of object in unsymmetrical observations is computed from the formula

$$\Delta' = \frac{\Delta}{3600} I$$

where Δ' is the correction for motion, and Δ the hourly motion of the object in declination, both expressed in seconds of arc; I is the interval, in seconds of time, between the mean thread and the thread at which the bisection was made.

(4) In observations where threads A or B were employed, the correction for the distance of the thread from the central pair of threads was required, and the value of this correction is found on pages A.42 and B.3.

(5) The zenith-point correction is taken directly from Table C, and it is also given for each date at the bottom of the page.

The sum of the quantities in columns *nine* and *ten* gives the *apparent zenith distance south*.

The *eleventh* column contains the correction for refraction computed from BESSEL'S formula, employing the revised edition, Government Printing Office, Washington, 1887, of the tables given in the Appendix to the Washington Observations for 1845.

The *fourteenth* column contains the apparent north-polar distance of each object, or the adopted colatitude, $51^\circ 6' 21''.2 \pm$ the sum of the apparent zenith distance

south and the refraction. The upper sign is employed for a direct and the lower for a reflected observation.

The *fifteenth* column contains,

(1) For stars whose apparent positions are given in the American Ephemeris, the correction to the north-polar distance of the Ephemeris, obtained from each observation.

(2) For other stars, the reduction to their mean position for the fictitious epoch 1888.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(3) For the asteroids, the correction for parallax, computed from the data accompanying the ephemerides.

The corrections for parallax, semidiameter, and defective illumination for the Sun, Moon, and larger planets are given at the foot of the pages containing the observations.

All corrections for parallax, except those for the asteroids, are computed from the data contained in the American Ephemeris. When both limbs of an object were observed, the semidiameter is derived from the observation; but when only one limb was observed, the semidiameter is taken from the American Ephemeris.

The corrections for defective illumination are computed from the data of the American Ephemeris.

The readings of the barometer, the attached thermometer, and the external thermometer are given at the foot of each page.

CORRECTIONS TO THE STAR POSITIONS OF THE AMERICAN EPHEMERIS IN NORTH-POLAR DISTANCE, GIVEN BY INDIVIDUAL OBSERVATIONS WITH THE TRANSIT CIRCLE FROM JANUARY 1 TO MARCH 19, 1888.

The tables containing these corrections may be found on pages C.3-6, and give the date of the observation, the initial of the observer, and the correction for each observation in north-polar distance, copied from the last column of the pages of the observations.

A correction inclosed in a parenthesis signifies that it is rejected in the determination of the adopted mean result.

The mean polar distances thus found still require the following corrections:

- (1) For errors of division;
- (2) For flexure;
- (3) For error in zenith-point correction;
- (4) For error in assumed latitude.

Errors of division.—The corrections for errors of division of circle B were determined in November and December, 1865. These corrections are given in the following table,¹ which contains the correction to be applied to the mean of the readings of the four microscopes, in order to free this mean from the effect of errors of division. The argument with which to enter the table is the reading of the horizontal microscope at circle B.

¹ Washington Observations for 1865, Description of Transit Circle, § 72.

TABLE V.—*Corrections for Errors of Division to be applied to the Mean of the Readings of the four Micrometer Microscopes of Circle B.*

Arg.	Corrections	Arg.	Corrections	Arg.	Corrections	Arg.	Corrections	Arg.	Corrections
0	"	0	"	0	"	0	"	0	"
0	+ 0.30	18	+ 0.57	36	+ 0.12	54	+ 0.14	72	+ 0.27
1	+ 0.23	19	+ 0.52	37	+ 0.15	55	+ 0.15	73	+ 0.28
2	+ 0.18	20	+ 0.48	38	+ 0.14	56	+ 0.16	74	+ 0.31
3	+ 0.18	21	+ 0.49	39	+ 0.08	57	+ 0.17	75	+ 0.35
4	+ 0.22	22	+ 0.52	40	+ 0.02	58	+ 0.19	76	+ 0.40
5	+ 0.27	23	+ 0.53	41	— 0.07	59	+ 0.20	77	+ 0.45
6	+ 0.27	24	+ 0.50	42	— 0.12	60	+ 0.22	78	+ 0.46
7	+ 0.26	25	+ 0.46	43	— 0.13	61	+ 0.26	79	+ 0.45
8	+ 0.26	26	+ 0.44	44	— 0.07	62	+ 0.28	80	+ 0.44
9	+ 0.27	27	+ 0.42	45	— 0.01	63	+ 0.27	81	+ 0.41
10	+ 0.29	28	+ 0.40	46	0.00	64	+ 0.25	82	+ 0.38
11	+ 0.29	29	+ 0.34	47	0.00	65	+ 0.22	83	+ 0.36
12	+ 0.29	30	+ 0.27	48	0.00	66	+ 0.22	84	+ 0.36
13	+ 0.36	31	+ 0.24	49	+ 0.06	67	+ 0.22	85	+ 0.36
14	+ 0.44	32	+ 0.22	50	+ 0.12	68	+ 0.22	86	+ 0.40
15	+ 0.52	33	+ 0.19	51	+ 0.12	69	+ 0.23	87	+ 0.44
16	+ 0.56	34	+ 0.15	52	+ 0.12	70	+ 0.24	88	+ 0.44
17	+ 0.57	35	+ 0.11	53	+ 0.13	71	+ 0.25	89	+ 0.37

The corrections in this table are only applicable when the microscopes are 90° apart and their supporting arms make an angle of 45° with the vertical.

The following table gives the argument, in all cases, with which to enter Table V to obtain the division correction which must be applied to an observed north-polar distance. In this table R_0 is the reading of the horizontal microscope at circle B when the telescope points to the zenith; $\angle$ is the observed north-polar distance of the object, and the last column indicates the use of the sign of the correction in Table V.

The argument will, of course, be brought into the first quadrant.

TABLE VI.—*Argument for Table V.*

Clamp	Observation	Argument	Sign of Correction
East	Direct	$R_0 + 51.1 - \angle$	Changed
	Reflected	$R_0 + 38.9 + \angle$	Same
West	Direct	$R_0 + 38.9 + \angle$	Same
	Reflected	$R_0 + 51.1 - \angle$	Changed

Flexure.—The correction to an observed circle reading for flexure of circle¹ is, for circle B, $+ 0''.84 \sin R - 0''.86 \cos R$, where R is the reading of the horizontal microscope when the telescope is pointed to the object. Changing the expression for the

¹ Washington Observations, 1865, Description of Transit Circle, § 61.

correction for flexure of circle, so that the correction will be a function of the north-polar distance, we have the following table for circle B:

TABLE VII.—*Flexure of Circle B.*

Clamp	Observation	Correction
East	Direct	" ° — 1.20 sin (R ₀ + 5.4 — Δ)
	Reflected	+ 1.20 sin (R ₀ + 83.2 + Δ)
West	Direct	" ° + 1.20 sin (R ₀ + 263.2 + Δ)
	Reflected	— 1.20 sin (R ₀ + 185.4 — Δ)

where the quantities have the same significance as in Table VI.

From observations¹ made in 1872 and 1873, the following formulæ were obtained for determining the correction to be applied to an observed north-polar distance for the effect of flexure of telescope and curvature of level for circle B:

TABLE VIII.—*Flexure of Telescope, etc.*

Clamp	Observation	Correction
East	Direct	" ° — 0.95 sin (Δ — 33.3)
	Reflected	+ 1.10 sin (Δ — 66.4)
West	Direct	" ° — 0.95 sin (Δ — 68.9)
	Reflected	+ 1.10 sin (Δ — 35.8)

Error in zenith-point corrections.—The value of the constant error in the zenith-point corrections is obtained from a comparison of the direct and reflected observations in each year. As the instrument was not reversed at the beginning of 1888, the observations of 1887 and 1888 were combined in the determination of the constant error in the zenith-point corrections. Therefore, the correction to be applied to the results in 1888, up to March 19, is the same as that printed in the volume for 1887. The computation is reprinted from the volume for 1887. Observations were not used in this discussion except when the star was observed direct and reflected at the same transit.

The method of obtaining the value of this error is shown in Table IX, where the results of the observations are collected. In this table the *first* column contains the names of all the stars observed by reflection in 1887, and to March 19, 1888. The *second* column contains the right ascension to the nearest tenth of an hour. The *third* column contains the mean values of the north-polar distances as given by direct observations; and the *fourth* column contains the seconds of the mean values obtained from reflected observations. The small subscript figures indicate the number of observations made on each star. The *fifth* column contains the difference between the

¹ Introduction to Transit Circle, Washington Observations, 1872, page lxiv.

direct and reflected observations. The *sixth* column contains the corrections which must be applied to the quantities in the *fifth* column on account of the errors of graduation and flexure of telescope and circle. The *seventh* column contains the sums of the quantities in the *fifth* and *sixth* columns.

The *eighth* column contains the weights of the values of $2\Delta Z'$ in the *seventh* column. As there are the same number of observations reflected as direct, the weight assigned is simply the square root of the number of observations.

The *ninth* column contains the products of the quantities in the *seventh* column by their respective weights, and the final results are:

From observations north of the zenith $\Delta Z' = +0''.05$

From observations south of the zenith $\Delta Z' = -0''.76$

The *corrections* for the constant *error* in the zenith-point correction are:

From stars north of the zenith $\Delta Z = -0''.05$

From stars south of the zenith $\Delta Z = +0''.76$

TABLE IX.—*Computation of the Value of $\Delta Z'$ from Observations in 1887 and to March 19, 1888.*

NORTHERN STARS

Name of Star	<i>a</i>	Observed N. P. Distance		D. — R.	Correction to D. — R.	$2\Delta Z'$	<i>p</i>	$2p\Delta Z'$
		Direct	Reflected					
	h	° ' "	"	"	"	"		"
ζ Ursæ Minoris . . .	15.8	11 51 28.81	29.51 ₁	— 0.70	+ 0.36	— 0.34	1.00	— 0.34
9 (H) Draconis . . .	10.4	13 42 18.06	18.66 ₂	— 0.60	+ 0.57	— 0.03	1.41	— 0.04
Piazzī VII, 67 . . .	7.3	21 18 17.31	17.11 ₂	+ 0.20	+ 0.68	+ 0.88	1.41	+ 1.24
ο Cephei	23.2	22 30 23.18	23.38 ₁	— 0.20	+ 0.68	+ 0.48	1.00	+ 0.48
32 Ursæ Majoris . . .	10.2	24 19 42.29	43.36 ₃	— 1.07	+ 0.69	— 0.38	1.73	— 0.66
α Draconis	14.0	25 5 1.69	1.39 ₂	+ 0.30	+ 0.69	+ 0.99	1.41	+ 1.40
κ Cassiopeæ	0.4	27 41 30.50	31.20 ₁	— 0.70	+ 0.55	— 0.15	1.00	— 0.15
ο Ursæ Majoris . . .	8.3	28 54 17.20	18.07 ₃	— 0.87	+ 0.45	— 0.42	1.73	— 0.73
α Cassiopeæ	0.6	34 4 56.94	56.84 ₁	+ 0.10	+ 0.24	+ 0.34	1.00	+ 0.34
27 Lyncis	8.0	38 10 6.80	7.20 ₁	— 0.40	+ 0.14	— 0.26	1.00	— 0.26
Lalande 458	0.3	38 36 23.40	22.60 ₂	+ 0.80	+ 0.15	+ 0.95	1.41	+ 1.34
θ Persei	2.6	41 15 0.70	0.00 ₁	+ 0.70	+ 0.09	+ 0.79	1.00	+ 0.79
ι Ursæ Majoris . . .	8.9	41 30 54.87	54.83 ₅	+ 0.04	+ 0.10	+ 0.14	2.24	+ 0.31
26 Lyncis	7.8	42 8 36.80	36.80 ₁	0.00	+ 0.15	+ 0.15	1.00	+ 0.15
ε Persei	4.0	42 35 25.60	25.20 ₁	+ 0.40	+ 0.18	+ 0.58	1.00	+ 0.58
λ Bootis	14.2	43 23 32.90	33.05 ₂	— 0.15	+ 0.18	+ 0.03	1.41	+ 0.04
α Aurigæ	5.1	44 7 3.55	4.89 ₃	— 1.34	+ 0.19	— 1.15	1.73	— 1.99
ψ Ursæ Majoris . . .	11.1	44 53 17.90	18.00 ₁	— 0.10	+ 0.16	+ 0.06	1.00	+ 0.06
								$\Delta Z' = +0''.05$

TABLE IX.—*Computation of the Value of $\Delta Z'$ from Observations in 1887-88—Continued*

SOUTHERN STARS

Name of Star	a	Observed N. P. Distance		D. — R.	Correction to D. — R.	$2\Delta Z'$	p	$\frac{1}{2}p\Delta Z'$
		Direct	Reflected					
	h	° ' "	"	"	"	"		"
α^2 Geminorum	7.5	57 51 51.61	54.51 ₁	— 2.90	+ 0.28	— 2.62	1.00	— 2.62
ρ Bootis	14.4	59 7 54.13	55.83 ₁	— 1.70	+ 0.31	— 1.39	1.00	— 1.39
χ Geminorum	7.9	61 53 21.47	23.37 ₃	— 1.90	+ 0.21	— 1.69	1.73	— 2.92
ε Leonis	9.6	65 42 20.73	22.33 ₁	— 1.60	+ 0.44	— 1.16	1.00	— 1.16
41 Leonis Minoris	10.6	66 13 11.65	13.55 ₂	— 1.90	+ 0.46	— 1.44	1.41	— 2.03
ζ Andromedæ	0.7	66 20 50.70	52.60 ₁	— 1.90	+ 0.47	— 1.43	1.00	— 1.43
δ Geminorum	7.2	67 48 36.27	37.77 ₁	— 1.50	+ 0.49	— 1.01	1.00	— 1.01
γ Cancræ	8.6	68 7 29.90	31.80 ₁	— 1.90	+ 0.49	— 1.41	1.00	— 1.41
ζ Arietis	3.1	69 22 28.48	30.08 ₁	— 1.60	+ 0.51	— 1.09	1.00	— 1.09
γ^1 Leonis	10.2	69 35 12.28	15.08 ₁	— 2.80	+ 0.52	— 2.28	1.00	— 2.28
β Arietis	1.8	69 44 39.80	41.70 ₁	— 1.90	+ 0.52	— 1.38	1.00	— 1.38
α Bootis	14.2	70 13 43.04	44.84 ₁	— 1.80	+ 0.55	— 1.25	1.00	— 1.25
η Bootis	13.8	71 2 6.44	9.14 ₁	— 2.70	+ 0.61	— 2.09	1.00	— 2.09
ζ Cancræ AB (<i>medium</i>)	8.1	72 0 42.60	44.10 ₁	— 1.50	+ 0.67	— 0.83	1.00	— 0.83
α Tauri	4.5	73 43 6.64	8.84 ₁	— 2.20	+ 0.79	— 1.41	1.00	— 1.41
11 Orionis	5.0	74 45 13.52	16.02 ₁	— 2.50	+ 0.93	— 1.57	1.00	— 1.57
α Leonis	10.0	77 28 49.40	52.50 ₄	— 3.10	+ 1.07	— 2.03	2.00	— 4.06
σ Piscium	1.6	81 24 39.78	41.28 ₁	— 1.50	+ 1.09	— 0.41	1.00	— 0.41
ε Piscium	0.9	82 43 5.19	7.84 ₂	— 2.65	+ 1.09	— 1.56	1.41	— 2.20
τ Leonis	11.4	86 31 14.97	17.42 ₂	— 2.45	+ 1.21	— 1.24	1.41	— 1.75
ζ Virginis	13.5	90 1 2.26	5.46 ₁	— 3.20	+ 0.91	— 2.29	1.00	— 2.29
δ Ophiuchi	16.1	93 24 7.78	9.88 ₁	— 2.10	+ 0.84	— 1.26	1.00	— 1.26
12 Ceti	0.4	94 34 52.78	55.28 ₁	— 2.50	+ 0.83	— 1.67	1.00	— 1.67
								$\Delta Z' = -0''.76$

Error of latitude.—The error of assumed co-latitude is derived from a comparison of the observations of the same stars, both above and below the pole. Table X exhibits the method of obtaining the value of the error $\Delta\phi'$. The *sixth* column contains the sum of the corrections for the errors of division, flexure, and assumed zenith point.

The *eighth* column contains the weights of the values of $2\Delta\phi'$ in the *seventh* column. The weights are computed by the formula

$$p = \frac{12mn}{2mn + 11(m+n)}$$

where p is the weight, m the number of observations above the pole, and n the number of observations below the pole.

The other columns will require no explanation.

From this table it is found that $\Delta\varphi' = -0''.66$ and the correction to the assumed latitude $\Delta\varphi = -0''.66$.

TABLE X.—*Computation of the Value of $\Delta\varphi'$ from Observations in 1887 and to March 19, 1888.*

Name of Star	α	Observed N. P. Distance		(U. + L.) — 360°	Corr. to (U. + L.) — 360°	$2\Delta\phi'$	p	$2p\Delta\phi'$
		Culmination						
		Upper	Lower					
	h	o' "	"	"	"	"		"
λ Ursæ Minoris . . .	19.6	1 2 22.99 ₅	35.27 ₄	— 1.74	+ 0.43	— 1.31	1.73	— 2.27
Polaris	1.3	1 17 37.30 ₄₆	20.13 ₂₅	2.57	0.46	2.11	4.48	9.45
51 (H) Cephei	6.8	2 46 41.25 ₁₄	17.42 ₅	1.33	0.63	0.70	2.41	1.69
δ Ursæ Minoris . . .	18.2	3 23 19.56 ₁₁	38.62 ₁₉	1.82	0.67	1.15	3.35	3.85
32 ¹ Camelopardalis . .	12.8	5 58 2.00 ₁	55.40 ₂	— 2.60	+ 0.67	— 1.93	0.65	— 1.25
32 ² Camelopardalis . .	12.8	5 58 20.35 ₁	37.10 ₂	— 2.55	+ 0.67	— 1.88	0.65	— 1.22
ϵ Ursæ Minoris . . .	17.0	7 46 40.52 ₄	18.31 ₄	1.17	0.66	0.51	1.60	0.82
12-Year Cat. 1879 . .	20.9	9 52 18.11 ₁	39.46 ₃	2.43	0.69	1.74	0.72	1.25
γ Cephei	23.6	12 59 52.20 ₂	5.75 ₁	2.05	0.98	1.07	0.65	0.70
β Ursæ Minoris . . .	14.9	15 22 56.15 ₄	1.50 ₁	— 2.35	+ 1.01	— 1.34	0.76	— 1.02
Groombridge 4163 . .	23.8	16 13 5.20 ₂	53.40 ₁	— 1.40	+ 0.96	— 0.44	0.65	— 0.29
γ^2 Ursæ Minoris . . .	15.3	17 45 49.11 ₂	7.99 ₁	2.90	0.82	2.08	0.65	1.35
κ Draconis	12.5	19 35 17.68 ₁	40.42 ₂	1.90	0.78	1.12	0.65	0.73
β^2 Cephei	21.5	19 56 5.69 ₁	52.41 ₃	1.90	0.79	1.11	0.72	0.80
σ^2 Ursæ Majoris . .	9.0	22 24 26.40 ₃	31.47 ₁	— 2.13	+ 0.73	— 1.40	0.72	— 1.01
ι Cephei	22.8	24 23 37.28 ₁	21.42 ₁	— 1.30	+ 0.66	— 0.64	0.50	— 0.32
α Draconis	14.0	25 5 1.79 ₃	57.26 ₂	0.95	0.64	0.31	1.08	0.33
α Cephei	21.3	27 53 33.31 ₂	24.34 ₂	— 2.35	+ 0.53	— 1.82	0.92	— 1.67
$\Delta\phi' = -0''.66$								

Systematic corrections from January 1 to March 19.—Collecting the results from all the data, the total systematic correction to be applied to an observed north-polar distance in 1887 and to March 19, 1888, is:

For objects *north* of the zenith:

Observed directly Corr. = Div. Corr. + $0''.53 \sin (\Delta + 6^\circ.2) - 0''.05 + 0''.66$

Observed by reflection . . Corr. = Div. Corr. + $0''.46 \sin (\Delta + 55^\circ.1) + 0''.05 + 0''.66$

For objects *south* of the zenith:

Observed directly Corr. = Div. Corr. + $0''.53 \sin (\Delta + 6^\circ.2) + 0''.76 + 0''.66$

Observed by reflection . . Corr. = Div. Corr. + $0''.46 \sin (\Delta + 55^\circ.1) - 0''.76 + 0''.66$

The numerical values of these expressions are given in Table XI with the argument north-polar distance. The *second* column contains the corrections for the errors

in the division of circle B. The *third* column contains the sums of the corrections for flexure of circle B, flexure of telescope, effect of gravity on the zenith-distance micrometer, and, in the case of reflection observations, curvature of the surface of the mercury. The *fourth* column contains the sum of the corrections for errors in the assumed latitude and constant error in the zenith-point corrections.

As the computed value of ΔZ is not the same for northern as for southern objects, to avoid an abrupt change at the zenith the value is gradually changed between 46° and 56° north-polar distance. The *fifth* column contains the sum of all the corrections.

TABLE XI.—*Systematic Corrections to be applied to the North-Polar Distances of objects observed with the Transit Circle in 1887 and to March 19, 1888.*

DIRECT OBSERVATIONS

N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \varphi$	Total	N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \varphi$	Total
0	"	"	"	"	0	"	"	"	"
0	+ 0.18	+ 0.06	+ 0.61	+ 0.85	30	+ 0.22	+ 0.31	+ 0.61	+ 1.14
1	.18	.07	.61	.86	31	.19	.32	.61	1.12
2	.22	.08	.61	.91	32	.15	.33	.61	1.09
3	.27	.08	.61	.96	33	.11	.33	.61	1.05
4	+ 0.27	+ 0.09	+ 0.61	+ 0.97	34	+ 0.12	+ 0.34	+ 0.61	+ 1.07
5	+ 0.26	+ 0.10	+ 0.61	+ 0.97	35	+ 0.15	+ 0.35	+ 0.61	+ 1.11
6	.26	.11	.61	.98	36	.14	.36	.61	1.11
7	.27	.12	.61	1.00	37	.08	.36	.61	1.05
8	.29	.13	.61	1.03	38	+ 0.02	.37	.61	1.00
9	+ 0.29	+ 0.14	+ 0.61	+ 1.04	39	— 0.07	+ 0.38	+ 0.61	+ 0.92
10	+ 0.29	+ 0.15	+ 0.61	+ 1.05	40	— 0.12	+ 0.38	+ 0.61	+ 0.87
11	.36	.16	.61	1.13	41	.13	.39	.61	.87
12	.44	.17	.61	1.22	42	.07	.39	.61	.93
13	.52	.17	.61	1.30	43	— .01	.40	.61	1.00
14	+ 0.56	+ 0.18	+ 0.61	+ 1.38	44	0.00	+ 0.41	+ 0.61	+ 1.02
15	+ 0.57	+ 0.19	+ 0.61	+ 1.37	45	0.00	+ 0.41	+ 0.61	+ 1.02
16	.57	.20	.61	1.38	46	.00	.42	.61	1.03
17	.52	.21	.61	1.34	47	+ 0.06	.42	.66	1.14
18	.48	.22	.61	1.31	48	.12	.43	.72	1.27
19	+ 0.49	+ 0.23	+ 0.61	+ 1.33	49	+ 0.12	+ 0.44	+ 0.80	+ 1.36
20	+ 0.52	+ 0.23	+ 0.61	+ 1.36	50	+ 0.12	+ 0.44	+ 0.90	+ 1.46
21	.53	.24	.61	1.38	51	.13	.45	1.02	1.60
22	.50	.25	.61	1.36	52	.14	.45	1.14	1.73
23	.46	.26	.61	1.33	53	.15	.46	1.24	1.85
24	+ 0.44	+ 0.27	+ 0.61	+ 1.32	54	+ 0.16	+ 0.46	+ 1.42	+ 1.94
25	+ 0.42	+ 0.27	+ 0.61	+ 1.30	55	+ 0.17	+ 0.46	+ 1.38	+ 2.01
26	.40	.28	.61	1.29	56	.19	.47	1.42	2.08
27	.34	.29	.61	1.24	57	.20	.47	1.42	2.09
28	.27	.30	.61	1.18	58	.22	.48	1.42	2.12
29	+ 0.24	+ 0.31	+ 0.61	+ 1.16	59	+ 0.26	+ 0.48	+ 1.42	+ 2.16

TABLE XI.—*Systematic Corrections for 1887-88—Continued*

DIRECT OBSERVATIONS

N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \varphi$	Total	N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \varphi$	Total
0	"	"	"	"	0	"	"	"	"
60	+ 0.28	+ 0.48	+ 1.42	+ 2.18	100	+ 0.29	+ 0.51	+ 1.42	+ 2.22
61	.27	.49	1.42	2.18	101	.36	.51	1.42	2.29
62	.25	.49	1.42	2.16	102	.44	.50	1.42	2.36
63	.22	.50	1.42	2.14	103	.52	.50	1.42	2.44
64	+ 0.22	+ 0.50	+ 1.42	+ 2.14	104	+ 0.56	+ 0.50	+ 1.42	+ 2.48
65	+ 0.22	+ 0.50	+ 1.42	+ 2.14	105	+ 0.57	+ 0.49	+ 1.42	+ 2.48
66	.22	.50	1.42	2.14	106	.57	.49	1.42	2.48
67	.23	.51	1.42	2.16	107	.52	.49	1.42	2.43
68	.24	.51	1.42	2.17	108	.48	.48	1.42	2.38
69	+ 0.25	+ 0.51	+ 1.42	+ 2.18	109	+ 0.49	+ 0.48	+ 1.42	+ 2.39
70	+ 0.27	+ 0.51	+ 1.42	+ 2.20	110	+ 0.52	+ 0.48	+ 1.42	+ 2.42
71	.28	.52	1.42	2.22	111	.53	.47	1.42	2.42
72	.31	.52	1.42	2.25	112	.50	.47	1.42	2.39
73	.35	.52	1.42	2.29	113	.46	.46	1.42	2.34
74	+ 0.40	+ 0.52	+ 1.42	+ 2.34	114	+ 0.44	+ 0.46	+ 1.42	+ 2.32
75	+ 0.45	+ 0.52	+ 1.42	+ 2.39	115	+ 0.42	+ 0.45	+ 1.42	+ 2.29
76	.46	.53	1.42	2.41	116	.40	.45	1.42	2.27
77	.45	.53	1.42	2.40	117	.34	.44	1.42	2.20
78	.44	.53	1.42	2.39	118	.27	.44	1.42	2.13
79	+ 0.41	+ 0.53	+ 1.42	+ 2.36	119	+ 0.24	+ 0.43	+ 1.42	+ 2.09
80	+ 0.38	+ 0.53	+ 1.42	+ 2.33	120	+ 0.22	+ 0.43	+ 1.42	+ 2.07
81	.36	.53	1.42	2.31	121	.19	.42	1.42	2.03
82	.36	.53	1.42	2.31	122	.15	.42	1.42	1.99
83	.36	.53	1.42	2.31	123	.11	.41	1.42	1.94
84	+ 0.40	+ 0.53	+ 1.42	+ 2.35	124	+ 0.12	+ 0.40	+ 1.42	+ 1.94
85	+ 0.44	+ 0.53	+ 1.42	+ 2.39	125	+ 0.15	+ 0.40	+ 1.42	+ 1.97
86	.44	.53	1.42	2.39	126	.14	.39	1.42	1.95
87	.37	.53	1.42	2.32	127	.08	.39	1.42	1.89
88	.30	.53	1.42	2.25	128	+ 0.02	.38	1.42	1.82
89	+ 0.23	+ 0.53	+ 1.42	+ 2.18	129	— 0.07	+ 0.37	+ 1.42	+ 1.72
90	+ 0.18	+ 0.53	+ 1.42	+ 2.13	130	— 0.12	+ 0.37	+ 1.42	+ 1.67
91	.18	.53	1.42	2.13	131	.13	.36	1.42	1.65
92	.22	.52	1.42	2.16	132	.07	.35	1.42	1.70
93	.27	.52	1.42	2.21	133	— .01	.35	1.42	1.76
94	+ 0.27	+ 0.52	+ 1.42	+ 2.21	134	0.00	+ 0.34	+ 1.42	+ 1.76
95	+ 0.26	+ 0.52	+ 1.42	+ 2.20	135	0.00	+ 0.33	+ 1.42	+ 1.75
96	.26	.52	1.42	2.20	136	.00	.32	1.42	1.74
97	.27	.52	1.42	2.21	137	+ 0.06	.32	1.42	1.80
98	.29	.51	1.42	2.22	138	.12	.31	1.42	1.85
99	+ 0.29	+ 0.51	+ 1.42	+ 2.22	139	+ 0.12	+ 0.30	+ 1.42	+ 1.84

TABLE XI.—*Systematic Corrections for 1887-88—Continued*

S. P.

N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \phi$	Total	N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \phi$	Total
0	"	"	"	"	0	"	"	"	"
325	+ 0.17	— 0.26	+ 0.61	+ 0.52	345	+ 0.45	— 0.08	+ 0.61	+ 0.98
326	.19	.25	.61	.55	346	.46	.07	.61	1.00
327	.20	.24	.61	.57	347	.45	.06	.61	1.00
328	.22	.23	.61	.60	348	.44	.05	.61	1.00
329	+ 0.26	— 0.22	+ 0.61	+ 0.65	349	+ 0.41	— 0.04	+ 0.61	+ 0.98
330	+ 0.28	— 0.21	+ 0.61	+ 0.68					
331	.27	.21	.61	.67	350	+ 0.38	— 0.03	+ 0.61	+ 0.96
332	.25	.20	.61	.66	351	.36	.03	.61	.94
333	.22	.19	.61	.64	352	.36	.02	.61	.95
334	+ 0.22	— 0.18	+ 0.61	+ 0.65	353	.36	— .01	.61	0.96
335	+ 0.22	— 0.17	+ 0.61	+ 0.66	354	+ 0.40	0.00	+ 0.61	+ 1.01
336	.22	.16	.61	.67					
337	.23	.15	.61	.69					
338	.24	.14	.61	.71	355	+ 0.44	+ 0.01	+ 0.61	+ 1.06
339	+ 0.25	— 0.14	+ 0.61	+ 0.72	356	.44	.02	.61	1.07
340	+ 0.27	— 0.13	+ 0.61	+ 0.75	357	.37	.03	.61	1.01
341	.28	.12	.61	.77	358	.30	.04	.61	0.95
342	.31	.11	.61	.81	359	+ 0.23	+ 0.05	+ 0.61	+ 0.89
343	.35	.10	.61	.86					
344	+ 0.40	— 0.09	+ 0.61	+ 0.92	360	+ 0.18	+ 0.06	+ 0.61	+ 0.85

REFLECTION OBSERVATIONS

0	— 0.46	+ 0.38	+ 0.71	+ 0.63	20	— 0.36	+ 0.44	+ 0.71	+ 0.79
1	.38	.38	.71	.71	21	.36	.45	.71	.80
2	.30	.39	.71	.80	22	.38	.45	.71	.78
3	.29	.39	.71	.81	23	.40	.45	.71	.76
4	— 0.29	+ 0.39	+ 0.71	+ 0.81	24	— 0.43	+ 0.45	+ 0.71	+ 0.73
5	— 0.27	+ 0.40	+ 0.71	+ 0.84	25	— 0.45	+ 0.45	+ 0.71	+ 0.71
6	.26	.40	.71	.85	26	.46	.45	.71	.70
7	.26	.41	.71	.86	27	.45	.46	.71	.72
8	.27	.41	.71	.85	28	.41	.46	.71	.76
9	— 0.27	+ 0.41	+ 0.71	+ 0.85	29	— 0.36	+ 0.46	+ 0.71	+ 0.81
10	— 0.23	+ 0.42	+ 0.71	+ 0.90	30	— 0.32	+ 0.46	+ 0.71	+ 0.85
11	.19	.42	.71	.94	31	.29	.46	.71	.88
12	.18	.42	.71	.95	32	.27	.46	.71	.90
13	.22	.43	.71	.92	33	.25	.46	.71	.92
14	— 0.29	+ 0.43	+ 0.71	+ 0.85	34	— 0.24	+ 0.46	+ 0.71	+ 0.93
15	— 0.36	+ 0.43	+ 0.71	+ 0.78	35	— 0.23	+ 0.46	+ 0.71	+ 0.94
16	.43	.44	.71	.72	36	.22	.46	.71	.95
17	.44	.44	.71	.71	37	.22	.46	.71	.95
18	.41	.44	.71	.74	38	.22	.46	.71	.95
19	— 0.37	+ 0.44	+ 0.71	+ 0.78	39	— 0.29	+ 0.46	+ 0.71	+ 0.88

TABLE XI.—*Systematic Corrections for 1887-88—Continued*

REFLECTION OBSERVATIONS

N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \phi$	Total	N. P. D.	Division Correction	Flexure Correction	$\Delta Z + \Delta \phi$	Total
0	"	"	"	"	0	"	"	"	"
40	— 0.24	+ 0.46	+ 0.71	+ 0.93	75	— 0.33	+ 0.35	— 0.10	— 0.08
41	.27	.46	.71	.90	76	.39	.35	.10	.14
42	.28	.46	.71	.89	77	.42	.34	.10	.18
43	.26	.46	.71	.91	78	.44	.34	.10	.20
44	— 0.23	+ 0.45	+ 0.71	+ 0.93	79	— 0.46	+ 0.33	— 0.10	— 0.23
45	— 0.20	+ 0.45	+ 0.71	+ 0.96	80	— 0.49	+ 0.32	— 0.10	— 0.27
46	.19	.45	.71	.97	81	.52	.32	.10	.30
47	— 0.17	+ 0.45	+ 0.71	+ 0.99	82	.52	.31	.10	.31
					83	.50	.31	.10	.29
					84	— 0.48	+ 0.30	— 0.10	— 0.28
55	+ 0.01	+ 0.43	— 0.10	+ 0.34	85	— 0.51	+ 0.29	— 0.10	— 0.32
56	.00	.43	.10	.33	86	.56	.29	.10	.37
57	.00	.43	.10	.33	87	.57	.28	.10	.39
58	.00	.42	.10	.32	88	.56	.28	.10	.38
59	+ 0.01	+ 0.42	— 0.10	+ 0.33	89	— 0.53	+ 0.27	— 0.10	— 0.36
60	+ 0.06	+ 0.42	— 0.10	+ 0.38	90	— 0.46	+ 0.26	— 0.10	— 0.30
61	.12	.41	.10	.43	91	.38	.26	.10	.22
62	.12	.41	.10	.43	92	.30	.25	.10	.15
63	+ .08	.41	.10	.39	93	.29	.24	.10	.15
64	0.00	+ 0.40	— 0.10	+ 0.30	94	— 0.29	+ 0.24	— 0.10	— 0.15
65	— 0.07	+ 0.40	— 0.10	+ 0.23	95	— 0.27	+ 0.23	— 0.10	— 0.14
66	.13	.39	.10	.16	96	.26	.22	.10	.14
67	.15	.39	.10	.14	97	.26	.22	.10	.14
68	.13	.39	.10	.16	98	.27	.21	.10	.16
69	— 0.11	+ 0.38	— 0.10	+ 0.17	99	— 0.27	+ 0.20	— 0.10	— 0.17
70	— 0.14	+ 0.38	— 0.10	+ 0.14	100	— 0.23	+ 0.19	— 0.10	— 0.14
71	.18	.37	.10	.09	101	.19	.19	.10	.10
72	.21	.37	.10	.06	102	— 0.18	+ 0.18	— 0.10	— 0.10
73	.24	.36	.10	+ 0.02					
74	— 0.26	+ 0.36	— 0.10	0.00					

Latitude.—Since the assumed value of the latitude is $+38^{\circ} 53' 38''.80$, the value given by each year's observations will be $+38^{\circ} 53' 38''.80 + \Delta \phi$.

The observed north-polar distances used in computing $\Delta \phi'$ had been corrected for constant error in the zenith-point correction, and in order to separate the values of the latitude obtained from direct and reflection observations, those corrections should be removed; hence—

$$\text{Latitude from direct observations} \dots = +38^{\circ} 53' 38''.80 + \Delta \phi - \Delta Z$$

$$\text{Latitude from reflection observations} \dots = +38^{\circ} 53' 38''.80 + \Delta \phi + \Delta Z$$

The following table exhibits the results obtained from 1866 to 1888:

TABLE XII.—*Latitude of Transit Circle*

Year	Latitude from Direct Observations			Latitude from Reflection Observations			Mean
	°	'	"	°	'	"	"
1866	+ 38	53	38.73	+ 38	53	37.67	38.20
1867			39.16			37.48	38.32
1868			38.69			37.73	38.21
1869			38.62			38.90	38.76
1870			38.71			39.57	39.14
1871 } 1872 }			39.11			36.49	37.80
1873			38.91			37.89	38.40
1874			38.31			38.27	38.29
1875			39.22			37.32	38.27
1876			38.64			37.50	38.07
1877			39.14			37.58	38.36
1878			38.07			38.29	38.18
1879			40.41			37.23	38.82
1880			36.36			38.12	37.24
1881			39.50			37.60	38.55
1882			37.70			38.78	38.24
1883			39.83			37.73	38.78
1884			37.88			38.10	37.99
1885			40.16			37.90	39.03
1886			38.07			38.59	38.33
1887 } 1888 }	+ 38	53	38.19	+ 38	53	38.09	38.14

Systematic Corrections from June 17 to December 31.—The north-polar distances deduced from observations made during the period June 17 to December 31, 1888, depend upon the positions of the standard stars as given in the American Ephemeris, and require no systematic corrections except for errors of division and for flexure of telescope and circle.

When the zenith-point corrections were computed from the observations of standard stars, the observed north-polar distances of those stars were not corrected for errors of division or for flexure. Therefore it was necessary to correct each resulting N. P. D. by the difference between the appropriate systematic correction and the *mean* systematic correction for the stars used in computing the zenith-point correction. The general systematic corrections to the north-polar distances observed between June 17 and December 31, 1888, are given in the table below. The *mean* systematic correction derived from Table XIII, and applicable to the computed zenith-point corrections is given for each date in Part II of Table C.

TABLE XIII.—*Systematic Corrections to Observations with the Transit Circle, June 17 to December 31, 1888*

DIRECT OBSERVATIONS

N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total
0	"	"	"	0	"	"	"	0	"	"	"
0	— 0.56	— 0.52	— 1.08	35	— 0.25	— 0.54	— 0.79	70	— 0.12	— 0.37	— 0.49
1	.52	.53	1.05	36	.24	.54	.78	71	.11	.36	.47
2	.45	.53	0.98	37	.23	.54	.77	72	.15	.35	.50
3	.37	.53	.90	38	.22	.54	.76	73	.19	.35	.54
4	— 0.30	— 0.54	— 0.84	39	— 0.22	— 0.53	— 0.75	74	— 0.22	— 0.34	— 0.56
5	— 0.29	— 0.54	— 0.83	40	— 0.22	— 0.53	— 0.75	75	— 0.24	— 0.33	— 0.57
6	.29	.54	.83	41	.22	.53	.75	76	.27	.32	.59
7	.27	.54	.81	42	.25	.52	.77	77	.33	.31	.64
8	.26	.55	.81	43	.27	.52	.79	78	.39	.31	.70
9	— 0.26	— 0.55	— 0.81	44	— 0.28	— 0.52	— 0.80	79	— 0.42	— 0.30	— 0.72
10	— 0.27	— 0.55	— 0.82	45	— 0.26	— 0.51	— 0.77	80	— 0.44	— 0.29	— 0.73
11	.27	.55	.82	46	.22	.51	.73	81	.46	.28	.74
12	.22	.55	.77	47	.20	.50	.70	82	.50	.27	.77
13	.18	.55	.73	48	.19	.50	.69	83	.53	.26	.79
14	— 0.18	— 0.56	— 0.74	49	— 0.17	— 0.50	— 0.67	84	— 0.52	— 0.26	— 0.78
15	— 0.23	— 0.56	— 0.79	50	— 0.16	— 0.49	— 0.65	85	— 0.49	— 0.25	— 0.74
16	.29	.56	.85	51	.15	.49	.64	86	.48	.24	.72
17	.36	.56	.92	52	.14	.48	.62	87	.52	.23	.75
18	.43	.56	0.99	53	.13	.48	.61	88	.56	.22	.78
19	— 0.44	— 0.56	— 1.00	54	— 0.12	— 0.47	— 0.59	89	— 0.57	— 0.21	— 0.78
20	— 0.40	— 0.56	— 0.96	55	— 0.12	— 0.46	— 0.58	90	— 0.56	— 0.20	— 0.76
21	.36	.56	.92	56	.12	.46	.58	91	.52	.19	.71
22	.36	.56	.92	57	.07	.45	.52	92	.45	.18	.63
23	.36	.56	.92	58	.01	.45	.46	93	.37	.17	.54
24	— 0.38	— 0.56	— 0.94	59	0.00	— 0.44	— 0.44	94	— 0.30	— 0.16	— 0.46
25	— 0.41	— 0.56	— 0.97	60	0.00	— 0.44	— 0.44	95	— 0.29	— 0.16	— 0.45
26	.44	.56	1.00	61	+ 0.01	.43	.42	96	.29	.15	.44
27	.45	.56	1.01	62	.06	.42	.36	97	.27	.14	.41
28	.46	.56	1.02	63	.12	.42	.30	98	.26	.13	.39
29	— 0.45	— 0.55	— 1.00	64	+ 0.12	— 0.41	— 0.29	99	.26	.12	.38
30	— 0.40	— 0.55	— 0.95	65	+ 0.08	— 0.40	— 0.32	100	— 0.27	— 0.11	— 0.38
31	.35	.55	.90	66	— 0.01	.40	.41	101	.27	.10	.37
32	.31	.55	.86	67	.07	.39	.46	102	.22	.09	.31
33	.28	.55	.83	68	.13	.38	.51	103	.18	.08	.26
34	— 0.27	— 0.55	— 0.82	69	— 0.15	— 0.38	— 0.53	104	— 0.18	— 0.07	— 0.25

TABLE XIII.—*Systematic Corrections to Observations with the Transit Circle, etc.*—Cont'd

DIRECT OBSERVATIONS—Continued

N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total
°	"	"	"	°	"	"	"	°	"	"	"
105	— 0.23	— 0.06	— 0.29	130	— 0.22	+ 0.18	— 0.04	340	— 0.12	— 0.42	— 0.54
106	.29	.05	.34	131	.22	.19	.03	341	.11	.43	.54
107	.36	.04	.40	132	.25	.20	.05	342	.15	.43	.58
108	.43	.03	.46	133	.27	.21	.06	343	.19	.44	.63
109	— 0.44	— 0.02	— 0.46	134	— 0.28	+ 0.22	— 0.06	344	— 0.22	— 0.45	— 0.67
110	— 0.40	— 0.01	— 0.41	135	— 0.26	+ 0.23	— 0.03	345	— 0.24	— 0.45	— 0.69
111	.36	.00	.36	136	.22	.24	+ 0.02	346	.27	.46	.73
112	.36	+ 0.01	.35	137	.20	.24	.04	347	.33	.46	.79
113	.36	.02	.34	138	.19	.25	.06	348	.39	.47	.86
114	— 0.38	+ 0.03	— 0.35	139	— 0.17	+ 0.26	+ 0.09	349	— 0.42	— 0.47	— 0.89
				S. P.							
115	— 0.41	+ 0.04	— 0.37	325	— 0.12	— 0.31	— 0.43	350	— 0.44	— 0.48	— 0.92
116	.44	.05	.39	326	.12	.32	.44	351	.46	.48	.94
117	.45	.06	.39	327	.07	.33	.40	352	.50	.49	0.99
118	.46	.07	.39	328	— .01	.34	.35	353	.53	.49	1.02
119	— 0.45	+ 0.08	— 0.37	329	0.00	— 0.34	— 0.34	354	— 0.52	— 0.50	— 1.02
120	— 0.40	+ 0.09	— 0.31	330	0.00	— 0.35	— 0.35	355	— 0.49	— 0.50	— 0.99
121	.35	.10	.25	331	+ 0.01	.36	.35	356	.48	.51	0.99
122	.31	.11	.20	332	.06	.37	.31	357	.52	.51	1.03
123	.28	.12	.16	333	.12	.37	.25	358	.56	.52	1.08
124	— 0.27	+ 0.12	— 0.15	334	+ 0.12	— 0.38	— 0.26	359	— 0.57	— 0.52	— 1.09
125	— 0.25	+ 0.13	— 0.12	335	+ 0.08	— 0.39	— 0.31				
126	.24	.14	.10	336	— 0.01	.40	.41				
127	.23	.15	.08	337	.07	.40	.47				
128	.22	.16	.06	338	.13	.41	.54				
129	— 0.22	+ 0.17	— 0.05	339	— 0.15	— 0.42	— 0.57				

REFLECTION OBSERVATIONS

0	+ 0.22	— 0.21	+ 0.01	10	+ 0.43	— 0.28	+ 0.15	20	+ 0.50	— 0.35	+ 0.15
1	.26	.22	.04	11	.51	.29	.22	21	.46	.36	.10
2	.27	.22	.05	12	.56	.30	.26	22	.44	.36	.08
3	.26	.23	.03	13	.57	.31	.26	23	.42	.37	.05
4	+ 0.26	— 0.24	+ 0.02	14	+ 0.57	— 0.31	+ 0.26	24	+ 0.40	— 0.38	+ 0.02
5	+ 0.27	— 0.25	+ 0.02	15	+ 0.52	— 0.32	+ 0.20	25	+ 0.35	— 0.38	— 0.03
6	.29	.25	.04	16	.48	.33	.15	26	.28	.39	.11
7	.29	.26	.03	17	.49	.33	.16	27	.24	.39	.15
8	.29	.27	.02	18	.52	.34	.18	28	.22	.40	.18
9	+ 0.35	— 0.28	+ 0.07	19	+ 0.53	— 0.34	+ 0.19	29	+ 0.19	— 0.40	— 0.21

TABLE XIII.—*Systematic Corrections to Observations with the Transit Circle, etc.*—Cont'd

REFLECTION OBSERVATIONS—Continued

N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total	N. P. D.	Div.	Flex.	Total
0	"	"	"	0	"	"	"	0	"	"	"
30	+ 0.15	— 0.41	— 0.26	61	+ 0.22	— 0.50	— 0.28	86	+ 0.31	— 0.47	— 0.16
31	.11	.41	.30	62	.22	.50	.28	87	.24	.46	.22
32	.12	.42	.30	63	.22	.50	.28	88	.18	.46	.28
33	.15	.42	.27	64	.22	.50	.28	89	.18	.46	.28
34	+ 0.14	— 0.43	— 0.29	65	+ 0.23	— 0.50	— 0.27	90	+ 0.22	— 0.45	— 0.23
35	+ 0.09	— 0.43	— 0.34	66	+ 0.24	— 0.50	— 0.26	91	+ 0.26	— 0.45	— 0.19
36	+ 0.03	.44	.41	67	.25	.50	.25	92	.27	.45	.18
37	— 0.06	.44	.50	68	.27	.50	.23	93	.26	.44	.18
38	.12	.44	.56	69	.28	.50	.22	94	.26	.44	.18
39	— 0.13	— 0.45	— 0.58	70	+ 0.31	— 0.50	— 0.19	95	+ 0.27	— 0.43	— 0.16
40	— 0.08	— 0.45	— 0.53	71	+ 0.35	— 0.50	— 0.15	96	+ 0.29	— 0.43	— 0.14
41	— 0.02	.46	.48	72	.40	.50	.10	97	.29	.43	.14
42	.00	.46	.46	73	.45	.50	.05	98	.29	.42	.13
43	.00	.46	.46	74	.46	.49	.03	99	.35	.42	— 0.07
44	0.00	— 0.47	— 0.47	75	+ 0.45	— 0.49	— 0.04	100	+ 0.43	— 0.41	+ 0.02
45	+ 0.05	— 0.47	— 0.42	76	+ 0.44	— 0.49	— 0.05	101	+ 0.51	— 0.41	+ 0.10
46	+ 0.11	— 0.47	— 0.36	77	.41	.49	.08	102	+ 0.56	— 0.40	+ 0.16
				78	.38	.49	.11				
				79	.36	.49	.13				
				80	+ 0.36	— 0.48	— 0.12				
56	+ 0.22	— 0.49	— 0.27	81	+ 0.36	— 0.48	— 0.12				
57	.26	.49	.23	82	.40	.48	.08				
58	.28	.50	.22	83	.44	.48	.04				
59	.27	.50	.23	84	.44	.47	.03				
60	+ 0.25	— 0.50	— 0.25	85	+ 0.37	— 0.47	— 0.10				

MEAN PLACES OF MISCELLANEOUS STARS GIVEN BY INDIVIDUAL OBSERVATIONS IN 1888

These are arranged in *two* separate collections on pages C.7–10. The *first* contains those stars observed between January 1 and March 19, whose north-polar distances depend on nadir observations. The *second* contains the stars observed between June 17 and December 31, whose north-polar distances depend upon the standard stars of the American Ephemeris. The systematic corrections used in this collection are the differences between the corrections given in Table XIII and the mean correction to the zenith-point correction, for each date, in Table C.

CATALOGUE OF MISCELLANEOUS STARS OBSERVED IN 1888

This catalogue is arranged in two parts and is found on pages C.11–14. It gives the name of each star; the observed magnitude; the deduced right ascension and north-polar distance for 1888.0; the precession, computed from the data given in the

American Ephemeris; the mean epoch of observation and the number of observations in right ascension and in north-polar distance. No correction has been applied for proper motion. The faint stars have received the correction for special personal equation given on pages A.48-9 of this Introduction.

POSITIONS AND SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS DEDUCED FROM OBSERVATIONS WITH THE TRANSIT CIRCLE IN 1888 AND COMPARED WITH THE EPHEMERIDES

The results of the observations are separated for the two observing periods, and are given on pages C.15-20.

The systematic corrections that have been applied for the second period are the differences between the corrections in Table XIII and the mean systematic corrections given in Table C for each date.

Defective illumination, etc.—When both limbs of an object presenting a fully illuminated disk have been observed, the adopted position of the center is the mean of that of the two limbs given in the twelfth and fourteenth columns of the observations. When only one full limb has been observed, the right ascension of the center is derived from the observed place of the limb by applying the “Time of the semidiameter passing the meridian,” taken from the Ephemeris. The declination of the center is obtained by applying the semidiameter of the Ephemeris.

If one of the limbs observed was defective, the observed difference of right ascension or declination of limbs is multiplied by the ratio of half this difference to the true semidiameter, and the observed semidiameter thus deduced is applied to the observed position of the full limb to obtain that of the center. The factors are determined as follows:

Let

- i = the elongation of Earth and Sun as seen from the planet;
- $b = \cos i$;
- δ, δ' = declinations of planet and Sun;
- A = difference of right ascensions of planet and Sun;
- θ = the angle which the line of cusps makes with the meridian;
- f, f' = factors by which the measured diameters in right ascension and declination must be multiplied to obtain true semidiameters.

To find f , we have

$$\tan \theta = \frac{\cos \delta \tan \delta'}{\sin A} - \frac{\sin \delta}{\tan A}$$

When the planet is gibbous,

$$\begin{aligned} g &= \cos \theta \sqrt{b^2 + \tan^2 \theta} = \cos \theta'' & , & \text{ when } \sin \theta'' = \cos \theta \sin i \\ g' &= \sin \theta \sqrt{b^2 + \cot^2 \theta} = \sin \theta' & , & \text{ when } \sin \theta' = \sin \theta \sin i \end{aligned}$$

$$f = \frac{1}{1 + g} \quad \text{and} \quad f' = \frac{1}{1 + g'}$$

When the illuminated disk is a crescent,

$$g = \sin \theta \quad f = \frac{1}{1 + g}$$

$$g' = \cos \theta \quad f' = \frac{1}{1 + g'}$$

For the Moon the correction for defective illumination in N. P. D. is obtained with more facility from the following formulæ, where the quantities have the same signification as above, E being an auxiliary angle:

$$\tan E = \tan \delta \cos A$$

$$\sin \theta' = \sin (\delta' - E) \cos \delta \sec E$$

$$\cos \theta' = g'$$

When the center of light of a planet has been observed, its reduction to the center of the planet is denoted by ε , and its value is obtained from the empirical formulæ

$$n = \frac{(1-b)(5+b)}{12}$$

In right ascension - - - - $\varepsilon = \text{semidiameter} \times n \cos \theta$

In north-polar distance - - - - $\varepsilon = \text{semidiameter} \times n \sin \theta$

The north-polar distances are also corrected for parallax in altitude, found at the foot of the pages of observations, and for errors of division, flexure, etc.

A discussion of all the observations of the Sun made in 1888 gives the following results:

TABLE XIV.—*Corrections to the Semidiameters of the Sun, given in the American Ephemeris, obtained from the mean of all the measures made by each Observer in 1888*

Observer	Sidereal Time of Semidiameter passing the Meridian	Vertical Semidiameter
	S	"
EASTMAN	— 0.02 ₁₄	— 0.7 ₁₄
SKINNER	— 0.06 ₁₅	— 1.7 ₁₅
PAUL	— 0.14 ₈	— 2.4 ₈
WINLOCK	— 0.10 ₂₀	— 0.9 ₂₀

The subscript figures indicate the number of observations on which each value depends.

When only one limb of the Sun was observed, the quantity in the last column of the observations is the semidiameter of the Ephemeris corrected by means of the above table.

Comparison with ephemerides.—In 1888 the observed positions of the Moon are compared directly with the places given in the *American Ephemeris*.

The observations of all the minor planets are compared with the ephemerides in the *Berliner Jahrbuch*. The observed time of transit converted into Washington mean time and increased by 6^h 1^m.8 gives the Berlin mean time of transit. Subtracting the “aberration time” of the ephemeris leaves the Berlin mean time at which the light left the planet, and for this instant the position of the planet is interpolated from the ephemeris in the *Jahrbuch* and compared with the observed place.

TABLE A.—*Adopted Values of the Collimation, Level, and Azimuth Constants, employed in the reduction of the Observations with the Transit Circle in 1888*

Adopted values of c_0 during the year $\left\{ \begin{array}{l} \text{January 3 to March 19 } c_0 = +0^s.272 \\ \text{June 18 to December 31 } c_0 = -0^s.134 \end{array} \right.$

Month and Day	c	b	a	Month and Day	c	b	a
1888	s	s	s	1888	s	s	s
January 3.9	+ 0.143	+ 0.013	— 0.760	June 18.0	+ 0.211	+ 0.238	0.000
10.4	.126	— 0.008	.708	18.4	+ 0.191	+ 0.319	+ 0.025
11.0	.152	+ 0.055	.760	July 25.0	.187	.150	— 0.757
11.4	.192	.077	.523	26.0	.198	.139	.850
12.0	+ 0.180	+ 0.131	— 0.695	August 2.0	.191	.113	.750
14.0	+ 0.121	+ 0.042	— 0.782	7.0	+ 0.218	+ 0.245	— 0.485
14.3	.129	.009	.782	8.0	+ 0.223	+ 0.250	— 0.557
15.9	.170	.032	.622	9.0	.205	.258	.700
19.0	.182	.033	.819	10.0	.179	.206	0.736
19.4	+ 0.188	+ 0.036	— 0.819	14.0	.166	.193	1.071
19.9	+ 0.180	+ 0.058	— 0.886	14.3	+ 0.168	+ 0.195	— 1.071
20.3	.157	.085	0.886	15.0	+ 0.192	+ 0.219	— 0.904
21.0	.184	.047	1.064	16.0	.225	.120	0.845
21.3	.203	.047	0.734	16.3	.200	.118	0.845
24.0	+ 0.148	+ 0.027	— 0.992	24.0	.179	.206	1.171
24.4	+ 0.168	+ 0.040	— 0.842	25.0	+ 0.174	+ 0.155	— 1.245
27.5	.216	.024	.828	28.0	+ 0.147	+ 0.174	— 1.170
28.0	.209	.025	.770	30.0	.184	.138	1.211
28.4	.210	.048	.770	September 12.0	.178	.058	0.985
February 2.3	+ 0.148	+ 0.073	— 0.761	12.3	.171	.072	0.984
8.4	+ 0.131	+ 0.021	— 0.763	13.0	+ 0.151	+ 0.110	— 1.019
13.5	.158	+ 0.065	0.844	13.3	+ 0.119	+ 0.110	— 1.019
18.0	.088	— 0.050	1.021	14.0	.137	.164	1.120
18.2	.087	— 0.050	— 1.021	14.3	.119	.146	1.120
23.4	+ 0.108	+ 0.006	+ 0.106	20.0	.160	.084	0.878
March 3.0	+ 0.084	— 0.010	— 0.276	21.0	+ 0.154	+ 0.050	— 0.860
6.0	.163	+ 0.016	.502	26.0	+ 0.123	+ 0.150	— 1.321
6.8	.160	— 0.012	.502	October 4.0	.094	.239	1.463
7.0	.136	+ 0.059	.532	10.0	.082	.228	1.497
8.0	+ 0.114	+ 0.015	— 0.757	17.0	.100	.266	1.436
9.0	+ 0.105	+ 0.017	— 0.722	17.5	+ 0.058	+ 0.151	— 1.436
9.4	.119	— 0.018	.623	17.7	+ 0.036	+ 0.304	— 1.426
10.0	.092	.000	.604	29.0	.085	.217	1.389
14.4	.147	+ 0.002	.910	29.4	.054	.207	1.389
15.0	+ 0.116	+ 0.027	— 0.856	30.5	.030	.277	1.372
15.4	+ 0.122	+ 0.027	— 0.856	31.0	+ 0.087	+ 0.194	— 1.456
18.2	.096	.006	.600	31.4	+ 0.076	+ 0.192	— 1.456
18.4	.121	0.023	.648	November 1.5	.088	.191	1.431
19.0	+ 0.068	— 0.016	— 0.784	6.0	.138	.093	1.348
				10.5	.066	.188	0.862
				11.3	+ 0.049	+ 0.190	— 0.900

TABLE A.—*Adopted Values of the Collimation, Level, and Azimuth Constants, etc.*—Cont'd

Month and Day				<i>c</i>	<i>b</i>	<i>a</i>	Month and Day				<i>c</i>	<i>b</i>	<i>a</i>
1888	d	s	s	s			1888	d	s	s	s		
November	12.4	+ 0.033	+ 0.148	— 1.098			December	15.4	— 0.006	+ 0.481	— 1.316		
	20.0	.044	.299	1.222				18.0	+ 0.031	.484	1.000		
	22.0	.012	.377	1.114				20.0	— 0.015	.595	0.640		
	30.0	.052	.331	1.450				20.4	.024	.596	.640		
December	5.0	+ 0.055	+ 0.362	— 1.280				20.9	— 0.003	+ 0.558	— 0.646		
	6.1	+ 0.024	+ 0.420	— 1.295				21.4	— 0.017	+ 0.566	— 0.646		
	6.4	.000	.420	1.295				22.0	.033	.577	.824		
	7.0	.029	.464	1.237				22.5	— 0.034	.586	.824		
	7.3	.025	.464	1.237				24.0	+ 0.017	.509	0.846		
	12.0	+ 0.016	+ 0.393	— 1.450				24.4	— 0.002	+ 0.543	— 1.087		
	13.0	+ 0.003	+ 0.429	— 1.339				28.0	+ 0.026	+ 0.534	— 0.575		
	13.3	— 0.024	.441	1.339				28.4	.000	.533	.575		
	14.0	.011	.456	1.346				29.0	+ 0.020	.499	.702		
	14.4	.024	.419	1.346				29.5	— 0.005	+ 0.540	— 0.702		
	15.0	— 0.005	+ 0.471	— 1.316									

TABLE B.—*Adopted Corrections and Rates of the Parkinson and Frodsham Sidereal Clock No. 610, in 1888*

Month and Day		Observer	Sidereal Hour	Clock Corrections	Hourly Rate	Month and Day		Observer	Sidereal Hour	Clock Corrections	Hourly Rate
1888			h	s	s	1888			h	s	s
Jan.	3.9	S.	16.16	— 25.203		Jan.	21.3	P.	2.90	— 23.180	+ 0.0098
	10.3	W.	3.52	— 24.672	+ 0.0266				5.05	— 23.153	
			5.10	— 24.630			23.9	P.	18.88	— 21.810	+ 0.0092
	10.9	S.	16.47	— 24.463	+ 0.0123		24.1		22.48	— 21.777	
	11.1		21.03	— 24.407			24.3	P.	2.37	— 21.823	+ 0.0452
	11.3	S.	2.56	— 24.560	+ 0.0089				4.87	— 21.710	
			6.38	— 24.526			27.5	P.	8.10	— 20.770	
	11.9	W.	16.58	— 24.390	— 0.0049						
			20.63	— 24.410			27.9	W.	19.02	— 20.662	+ 0.0069
	13.9	S.	17.20	— 23.562	— 0.0171		28.1		22.92	— 20.635	
	14.1		20.77	— 23.623			28.3	W.	3.64	— 20.546	+ 0.0200
	14.3	S.	2.28	— 23.622	— 0.0178				8.55	— 20.448	
			3.57	— 23.645		Feb.	2.3	S.	4.43	— 18.700	+ 0.0692
	15.9	W.	17.28	— 23.573					5.08	— 18.655	
	18.9	W.	18.02	— 23.395	— 0.0010		8.3	E.	3.88	— 20.892	— 0.0188
	19.1		0.82	— 23.402	— 0.0066				5.80	— 20.928	
	19.5		7.30	— 23.445			13.3	W.	6.15	— 22.575	— 0.0164
									11.53	— 22.663	
	19.9	S.	17.45	— 23.080	— 0.0201		17.9	P.	20.69	— 22.783	— 0.0315
	20.3		2.80	— 23.268			18.2		2.63	— 22.970	
	20.9	P.	18.35	— 23.167	+ 0.0065		23.4	W.	7.25	— 14.118	
	21.1		22.53	— 23.140							

TABLE B.—*Clock Corrections and Rates, etc., 1888—Continued*

Month and Day	Observer	Sidereal Hour	Clock Corrections	Hourly Rate	Month and Day	Observer	Sidereal Hour	Clock Corrections	Hourly Rate
1888		h	s	s	1888		h	s	s
March 2.9	E.	21.64	— 15.020	— 0.0106	Aug. 13.9	W.	7.42	— 26.392	— 0.0234
3.1		1.90	— 15.065		14.1		13.10	— 26.525	— 0.0456
					14.3		15.80	— 26.648	
5.9	W.	21.39	— 14.955	+ 0.0033					
6.1		1.90	— 14.940	+ 0.0055	14.9	S.	7.08	— 27.213	— 0.0255
6.8		19.57	— 14.843		15.1		12.85	— 27.360	
6.9	E.	20.87	— 14.800	— 0.0098					
7.1		1.67	— 14.847		15.9	W.	7.57	— 28.527	— 0.0387
					16.1		13.33	— 28.750	
7.9	S.	20.93	— 14.395	+ 0.0081					
8.1		0.40	— 14.367		16.3	W.	17.34	— 29.100	— 0.0174
							18.20	— 29.115	
8.9	P.	21.47	— 14.303	+ 0.0061					
9.1		1.25	— 14.280	— 0.0102	23.9	S.	9.50	— 39.345	— 0.0229
9.4		8.09	— 14.350		24.1		12.25	— 39.408	
9.9	W.	20.69	— 14.083	— 0.0108					
10.1		1.06	— 14.130		24.9	E.	7.57	— 40.673	— 0.0488
					25.1		12.63	— 40.920	
14.3	W.	8.39	— 13.270						
14.9	E.	21.21	— 13.080	+ 0.0129	27.9	S.	8.70	— 44.405	— 0.0122
15.1		1.63	— 13.023		28.1		12.63	— 44.453	
15.3	E.	7.49	— 12.983	— 0.0485					
		9.18	— 13.065		29.9	S.	9.70	— 46.155	— 0.0061
18.2	W.	3.83	— 13.295	+ 0.0915	30.1		12.63	— 46.173	
		4.65	— 13.220						
18.3	E.	7.67	— 13.240	— 0.0077	Sept. 11.9	S.	10.05	— 29.120	+ 0.0213
		9.35	— 13.253		12.1		13.33	— 29.050	— 0.0445
18.9	E.	0.69	— 13.093	— 0.0218	12.2		16.70	— 29.200	
		3.85	— 13.162						
					12.9	P.	9.83	— 30.130	— 0.0252
June 17.9	E.	3.75	— 40.898	— 0.0154	13.1		14.00	— 30.235	— 0.0606
18.1		7.97	— 40.963				18.70	— 30.520	
18.3		13.47	— 41.100	— 0.0297	13.9	W.	10.05	— 31.220	+ 0.0008
		15.42	— 41.158		14.1		13.63	— 31.217	— 0.0523
July 24.9	E.	5.80	— 68.510	— 0.0051	14.3		19.42	— 31.520	
25.1		10.27	— 68.533						
					19.9	W.	10.27	— 37.973	— 0.0582
25.9	P.	6.87	— 69.473	+ 0.0068	20.1		14.00	— 38.190	
26.1		11.27	— 69.443						
Aug. 1.9	W.	6.60	— 16.53	— 0.0230	20.9	S.	10.27	— 39.037	— 0.0392
2.1		10.95	— 16.63		21.1		13.33	— 39.157	
6.9	P.	7.40	— 18.728	— 0.0340	25.9	W.	10.60	— 44.955	— 0.0046
7.2		13.04	— 18.920		26.1		13.83	— 44.970	
7.9	W.	6.83	— 19.813	— 0.0294	Oct. 3.9	S.	11.45	— 50.695	+ 0.0281
8.2		12.85	— 19.990		4.1		15.12	— 50.592	
8.9	E.	7.57	— 21.123	— 0.0594	9.9	S.	11.92	— 53.173	+ 0.0113
9.1		11.73	— 21.370		10.1		16.63	— 53.120	
9.9	P.	7.60	— 22.390	— 0.0050	16.9	W.	11.45	— 54.395	— 0.0090
10.2		13.03	— 22.417		17.4		0.78	— 54.515	— 0.0132
					17.6		6.30	— 54.588	
					28.9	S.	12.87	+ 2.467	+ 0.0424
					29.1		15.70	+ 2.587	

July 27, Clock set back *one minute*.Oct. 18, Clock set back *one minute*.

TABLE B.—*Clock Corrections and Rates, etc., 1888—Continued*

Month and Day	Observer	Sidereal Hour	Clock Corrections	Hourly Rate	Month and Day	Observer	Sidereal Hour	Clock Corrections	Hourly Rate
1888		h	s	s	1888		h	s	s
Oct. 29.4	S.	0.40 2.53	+ 2.612 + 2.540	— 0.0338	Dec. 13.3	W.	1.22 1.97	+ 10.100 + 10.110	+ 0.0133
30.4	P.	2.20 2.60	+ 2.390 + 2.265	— 0.3125	13.9 14.1	S.	15.72 19.33	+ 10.760 + 10.910	+ 0.0416
30.9 31.1	E.	12.28 15.78	+ 2.435 + 2.508	+ 0.0209	14.3	E.	1.64 3.41	+ 11.002 + 11.069	+ 0.0379
31.4	E.	0.76 2.25	+ 2.366 + 2.335	— 0.0208	14.9 15.1 15.4	W.	15.33 20.18 3.81	+ 11.283 + 11.507 + 11.512	+ 0.0462 + 0.0007
Nov. 1.4	S.	23.98 2.08	+ 2.335 + 2.310	— 0.0119	17.9 18.1	S.	16.15 19.89	+ 11.900 + 11.962	+ 0.0166
5.9 6.1	W.	12.85 17.26	+ 0.880 + 0.828	— 0.0118	19.9 20.1	E.	15.85 19.70	+ 12.143 + 12.286	+ 0.0371
10.4	W.	2.19 4.25	— 0.698 — 0.708	— 0.0049	20.3	E.	1.76 3.21	+ 12.372 + 12.332	— 0.0276
11.3	E.	21.87 22.73	— 0.832 — 0.847	— 0.0174	20.9 21.3	W.	15.83 1.74 3.63	+ 12.573 + 12.675 + 12.633	+ 0.0103 — 0.0222
12.3	W.	0.20 3.66	— 0.705 — 0.518	+ 0.0540	21.9 22.1	S.	16.12 20.01	+ 13.245 + 13.468	+ 0.0573
19.9 20.1	W.	14.15 18.33	— 0.757 — 0.667	+ 0.0215	22.3	S.	1.69 4.99	+ 13.689 + 13.790	+ 0.0306
21.9 22.1	E.	14.20 17.72	+ 0.198 + 0.310	+ 0.0318	23.9 24.1	E.	16.60 20.53	+ 14.720 + 15.013	+ 0.0746
29.9	S.	15.27	+ 3.827		24.3	E.	1.93 3.11	+ 15.242 + 15.280	+ 0.0322
Dec. 4.9 5.1	E.	14.96 18.77 19.60	+ 5.330 + 5.480 + 5.457	+ 0.0394 — 0.0277	27.9 28.1	E.	16.73 20.62	+ 16.600 + 16.752	+ 0.0391
6.1 6.3	E.	19.78 2.70	+ 6.032 + 6.345	+ 0.0452	28.3	E.	1.77 4.14	+ 16.865 + 16.973	+ 0.0456
6.9 7.1 7.3	W.	14.42 20.68 1.13	+ 6.615 + 6.862 + 6.893	+ 0.0395 + 0.0070	28.9 29.1	W.	15.63 21.06	+ 17.263 + 17.410	+ 0.0271
11.9 12.1	S.	15.72 19.70	+ 9.850 + 9.910	+ 0.0151	29.3	W.	3.53 5.74	+ 17.508 + 17.634	+ 0.0571
12.9 13.1	W.	15.40 20.02	+ 9.952 + 10.080	+ 0.0277					

TABLE C: Part I.—*Zenith-point Corrections from Nadir Observations, 1888*

Month and Day	Hour	Observer	Object	Zenith-point Correction	Month and Day	Hour	Observer	Object	Zenith-point Correction
1888	h			' "	1888	h			' "
Jan. 3.9	16.6	S.	Nadir . . .	+ 1 11.06	Feb. 2.3	4.2	S.	Nadir . . .	+ 1 10.40
10.4	4.4	W.	Nadir . . .	+ 1 12.64	8.4	5.8	E.	Nadir . . .	+ 1 12.60
10.9	17.1	S.	Nadir . . .	+ 1 11.07	13.4	8.0	W.	Nadir . . .	+ 1 12.36
11.4	4.7	S.	Nadir . . .	+ 1 10.94	18.2	1.7	P.	Nadir . . .	+ 1 9.92
12.1	21.4	W.	Nadir . . .	+ 1 12.33	23.4	7.2	W.	Nadir . . .	+ 1 11.14
13.9	17.8	S.	Nadir . . .	+ 1 11.61	March 3.1	1.6	E.	Nadir . . .	+ 1 11.64
14.3	4.4	S.	Nadir . . .	+ 1 11.18	5.9	22.9	W.	Nadir . . .	+ 1 13.67
15.9	18.2	W.	Nadir . . .	+ 1 11.33	7.1	2.3	E.	Nadir . . .	+ 1 12.32
18.9	18.9	W.	Nadir . . .	+ 1 12.62	7.9	22.8	S.	Nadir . . .	+ 1 12.29
19.4	4.9	W.	Nadir . . .	+ 1 13.87	9.1	0.9	P.	Nadir . . .	+ 1 10.90
19.9	18.8	S.	Nadir . . .	+ 1 11.27	9.4	8.8	P.	Nadir . . .	+ 1 12.06
20.3	3.9	S.	Nadir . . .	+ 1 12.86	10.1	0.9	W.	Nadir . . .	+ 1 10.57
21.1	21.6	P.	Nadir . . .	+ 1 12.93	14.4	8.9	W.	Nadir . . .	+ 1 12.31
24.1	22.3	P.	Nadir . . .	+ 1 12.73	15.1	1.6	E.	Nadir . . .	+ 1 12.11
24.3	4.4	P.	Nadir . . .	+ 1 13.74	15.4	8.8	E.	Nadir . . .	+ 1 12.53
27.5	7.5	P.	Nadir . . .	+ 1 12.19	18.2	4.1	W.	Nadir . . .	+ 1 11.16
28.1	23.9	W.	Nadir . . .	+ 1 10.72	18.4	8.8	E.	Nadir . . .	+ 1 11.37
28.4	5.5	W.	Nadir . . .	+ 1 11.19	19.1	2.2	E.	Nadir . . .	+ 1 8.74

Part II.—*Zenith-point Corrections derived from Direct Observations of Standard Stars*

Date	Observer	Number of Stars used	Deduced Zenith-point Correction	Correction to Zenith-point Correction	Date	Observer	Number of Stars used	Deduced Zenith-point Correction	Correction to Zenith-point Correction
1888			' "	"	1888			' "	"
June 18.0	E.	6	+ 0 51.57	+ 0.56	Aug. 14.9	S.	5	+ 0 43.66	+ 0.51
18.3	E.	8	+ 0 56.21	+ 0.48	16.0	W.	7	+ 0 43.87	+ 0.55
July 25.0	E.	8	+ 0 46.08	+ 0.61	16.3	W.	5	+ 0 44.32	+ 0.68
26.0	P.	6	+ 0 45.43	+ 0.54	24.0	S.	6	+ 0 42.45	+ 0.60
Aug. 2.0	W.	4	+ 0 44.60	+ 0.60	25.0	E.	7	+ 0 43.84	+ 0.61
7.0	P.	9	+ 0 47.48	+ 0.66	28.0	S.	5	+ 0 43.62	+ 0.46
8.0	W.	4	+ 0 47.02	+ 0.66	30.0	S.	5	+ 0 44.34	+ 0.67
8.9	E.	3	+ 0 46.90	+ 0.54	Sept. 12.0	S.	5	+ 0 45.66	+ 0.68
10.0	P.	6	+ 0 46.60	+ 0.66	13.0	P.	5	+ 1 12.82	+ 0.61
14.0	W.	10	+ 0 44.51	+ 0.55	14.0	W.	4	+ 1 10.92	+ 0.68

TABLE C: Part II.—*Zenith-point Corrections, etc.*—Continued

Date	Observer	Number of Stars used	Deduced Zenith-point Correction	Correction to Zenith-point Correction	Date	Observer	Number of Stars used	Deduced Zenith-point Correction	Correction to Zenith-point Correction
1888			' "	"	1888			' "	"
Sept. 14.3	W.	4	+ 1 13.60	+ 0.82	Dec. 6.4	E.	13	+ 0 51.08	+ 0.66
20.0	W.	5	+ 1 13.74	+ 0.51	7.0	W.	8	+ 0 50.18	+ 0.55
21.0	S.	6	+ 1 13.12	+ 0.63	7.3	W.	4	+ 0 50.38	+ 0.74
26.0	W.	4	+ 1 11.40	+ 0.67	12.0	S.	8	+ 0 49.50	+ 0.67
Oct. 4.0	S.	7	+ 1 9.10	+ 0.63	13.0	W.	6	+ 0 50.67	+ 0.58
10.0	S.	9	+ 1 9.11	+ 0.63	13.3	W.	6	+ 0 50.90	+ 0.74
16.9	W.	3	+ 1 11.13	+ 0.63	14.0	S.	5	+ 0 49.14	+ 0.60
17.5	W.	8	+ 1 11.82	+ 0.61	14.4	E.	14	+ 0 49.80	+ 0.62
29.0	S.	5	+ 1 11.46	+ 0.65	15.0	W.	8	+ 0 48.28	+ 0.55
29.4	S.	5	+ 1 12.04	+ 0.61	15.4	W.	5	+ 0 49.98	+ 0.62
31.0	E.	8	+ 1 10.18	+ 0.65	18.0	S.	8	+ 0 52.20	+ 0.63
31.4	E.	12	+ 1 8.99	+ 0.66	20.0	E.	8	+ 0 53.81	+ 0.58
Nov. 1.4	S.	10	+ 1 9.13	+ 0.65	20.4	E.	7	+ 0 54.14	+ 0.57
6.0	W.	6	+ 1 8.78	+ 0.55	20.9	W.	2	+ 0 54.50	+ 0.55
10.4	W.	9	+ 1 13.03	+ 0.58	21.4	W.	7	+ 0 53.93	+ 0.57
11.3	E.	9	+ 1 11.72	+ 0.61	22.0	S.	9	+ 0 51.93	+ 0.69
12.4	W.	10	+ 1 11.10	+ 0.56	22.4	S.	13	+ 0 53.00	+ 0.61
20.0	W.	7	+ 1 8.73	+ 0.52	24.0	E.	7	+ 0 52.90	+ 0.60
22.0	E.	9	+ 1 8.21	+ 0.61	28.0	E.	9	+ 0 55.29	+ 0.62
29.9	S.	3	+ 1 8.33	+ 0.61	28.4	E.	12	+ 0 54.86	+ 0.56
Dec. 5.0	E.	8	+ 1 6.84	+ 0.64	29.0	W.	7	+ 0 54.69	+ 0.64
6.1	E.	4	+ 0 50.02	+ 0.73	29.4	W.	16	+ 0 54.56	+ 0.60

THE MERIDIAN TRANSIT

During the year 1888 this instrument was used for the determination of the errors of the standard mean-time clock in connection with the transmission of time. It has been in charge of Lieut. L. C. HEILNER, assisted by Lieut. B. W. HODGES.

A full description of the instrument, with its accessories, together with the methods used in observation, will be found in the volume for 1883.

The equatorial intervals of the wires have remained unchanged during the year, and are as follows:

Equatorial Intervals for 1888

Thread	Interval	Thread	Interval	Thread	Interval	Thread	Interval	Thread	Interval
A ₁	+ 37.695	B ₁	+ 19.117	C ₁	+ 3.246	D ₁	— 15.993	E ₁	— 30.305
A ₂	+ 35.872	B ₂	+ 17.659	C ₂	+ 1.609	D ₂	— 17.552	E ₂	— 32.796
A ₃	+ 34.159	B ₃	+ 15.175	C ₃	— 0.051	D ₃	— 19.300	E ₃	— 34.319
A ₄	+ 32.684			C ₄	— 1.673			E ₄	— 35.947
A ₅	+ 30.035			C ₅	— 3.141			E ₅	— 37.896

$A_0 + 45^s.136$ $r = + 0^s.051$ $E_6 - 45^s.364$
 Equatorial interval of micrometer threads: A to B + 36^s.723; B to C — 56^s.917

RESULTS OF OBSERVATIONS WITH THE MERIDIAN TRANSIT

These results will be found on pages B.31–44

The *first* column contains the day of observation, which begins with the transit of the Sun; and also gives the initials of the observer; the clamp of the instrument was East in all observations.

L. C. H.—Lieut. L. C. HEILNER

B. W. H.—Lieut. B. W. HODGES

The *second* column gives the name of the object observed.

The *third* column gives the number of threads over which each object was observed.

The *fourth* column gives the clock time of transit over the mean thread, or the mean of the standard set of eleven threads of groups B, C, and D. (See preceding table.) When stars have been observed over other or fewer threads they have been reduced to the mean thread by using the known intervals.

The *fifth* column contains the sum of the instrumental corrections, or Aa, Bb, Cc. Tables A and B, following this introduction, contain the quantities *c*, *b*, and *a*.

The *sixth* column contains the apparent clock corrections; those in full-faced type are due to azimuth or other stars more than 40° north of the equator.

In Table C the corrections given are the mean of the clock corrections due to (when possible) three or more stars, and this mean has been assumed to correspond to the mean of the times of transit. In a few instances it has been necessary to apply the personal equation of the observer to obtain an adopted clock correction. The personal equations have been determined by the personal equation machine, described in the volume for 1875. The adopted values are given below, with the sign of application to observed times:

Lieutenant HEILNER . .	^s +0.095 to Mar., 1888	^s +0.085 to Dec., 1888
Lieutenant HODGES . . .	+0.018 to Mar., 1888	0.00 to Dec., 1888

TABLE A.—This table gives the values of the collimation and level constants in the columns headed c_0 and b' respectively. These have been obtained by reversal over the mercury basin, using the collimating eyepiece. M' is the distance, in terms of the revolution of the micrometer screw (one revolution = 1.5866 seconds) of the middle thread from its image with the clamp east, and M the same distance with the clamp west. The sign is + when the thread is west of the image.

c_0 is the collimation of the *mean* thread with the correction for diurnal aberration applied.

TABLE A.—*Collimation and Level Constants*

Mean date	M'	M	c_0	b'	Temp.	Mean date	M'	M	c_0	b'	Temp.
1888	r	r	s	s	°	1888	r	r	s	s	°
Jan. 2. 2	+0.720	+0.158	+0.251	—0.354	35	Feb. 13. 3	+0.265	—0.120	+0.181	—0.064	42
3. 3	+0.470	.	+0.246	—0.161	38	14. 3	+0.073	.	+0.180	—0.058	45
10. 3	+0.458	(*)	+0.210	—0.188	42	15. 3	+0.468	+0.089	+0.178	—0.227	30
11. 3	+0.889	+0.243	+0.284	—0.455	26	16. 3	+0.384	.	+0.180	—0.160	31
14. 2	+0.332	—0.054	+0.181	—0.116	41	17. 3	+0.071	.	+0.170	+0.080	45
16. 3	+0.806	+0.215	+0.262	—0.411	32	18. 3	+0.081	.	+0.170	+0.070	43
18. 2	+0.682	.	+0.200	—0.380	35	22. 3	+0.065	—0.270	+0.161	+0.075	52
19. 2	+0.597	+0.256	+0.163	—0.344	32	23. 3	+0.131	.	+0.160	+0.020	48
21. 2	+0.730	.	+0.162	—0.325	28	26. 3	+0.222	—0.149	+0.175	—0.035	46
24. 2	+0.684	.	+0.160	—0.420	33	27. 3	+0.622	.	+0.179	—0.350	34
26. 3	+0.752	+0.242	+0.230	—0.400	33	28. 3	+0.602	.	+0.182	—0.330	34
27. 3	+0.640	+0.173	+0.213	—0.329	31	Mar. 3. 3	+0.209	—0.216	+0.197	—0.003	46
28. 2	+0.772	.	+0.210	—0.433	31	4. 3	+0.473	(*)	+0.216	—0.194	35
30. 3	+0.460	+0.082	+0.178	—0.221	38	6. 3	+0.646	.	+0.194	—0.353	30
						7. 3	+0.354	.	+0.183	—0.281	36
Feb. 1. 3	+0.449	.	+0.170	—0.220	35	8. 3	+0.250	—0.114	+0.172	—0.060	40
2. 3	+0.332	(*)	+0.160	—0.138	42	9. 3	+0.186	.	+0.178	—0.004	43
3. 4	+0.379	(*)	+0.178	—0.156	42	12. 3	+0.562	.	+0.194	—0.286	33
8. 3	+0.380	(*)	+0.179	—0.157	42	14. 3	+0.240	—0.206	+0.205	—0.019	39

* Coincidence.

TABLE A.—*Collimation and Level Constants*—Continued

Mean date	M'	M	c_0	b'	Temp.	Mean date	M'	M	c_0	b'	Temp.
1888	r	r	s	s	°	1888	r	r	s	s	°
Mar. 15.3	+0.120	.	+0.195	+0.066	42	June 1.3	-0.221	-0.097	-0.021	+0.120	69
17.3	+0.164	-0.206	+0.175	+0.011	44	3.3	-0.244	-0.105	-0.027	+0.132	63
18.3	+0.103	.	+0.174	+0.058	42	4.3	-0.293	.	+0.050	+0.250	68
21.3	-0.045	-0.409	+0.172	+0.174	56	5.3	-0.358	.	+0.130	+0.380	73
22.3	+0.651	.	+0.172	-0.378	31	6.3	-0.374	-0.619	+0.125	+0.388	81
29.3	-0.300	(*)	+0.147	+0.113	51	7.3	-0.310	.	+0.070	+0.280	75
30.3	-0.278	.	+0.162	+0.349	59	8.4	-0.303	-0.273	+0.016	+0.222	71
31.4	-0.258	.	+0.176	+0.347	61	9.3	-0.373	.	+0.020	+0.290	77
April 1.3	-0.104	-0.519	+0.193	+0.241	56	12.3	-0.352	-0.401	+0.047	+0.293	71
2.3	-0.380	.	+0.199	+0.467	.	13.3	-0.374	.	+0.088	+0.351	72
3.3	-0.135	-0.580	+0.205	+0.278	57	14.3	-0.385	.	+0.129	+0.400	78
4.3	-0.202	.	+0.195	+0.321	59	15.3	-0.412	-0.769	+0.170	+0.462	83
5.3	-0.348	-0.741	+0.184	+0.426	63	16.3	-0.332	.	+0.173	+0.402	80
6.3	-0.358	.	+0.180	+0.430	63	17.3	-0.390	-0.764	+0.176	+0.452	83
7.3	-0.259	-0.639	+0.179	+0.350	61	18.4	-0.472	.	+0.180	+0.520	85
8.3	-0.129	.	+0.180	+0.250	53	19.3	-0.428	.	+0.180	+0.480	83
9.4	-0.083	.	+0.170	+0.210	51	20.3	-0.473	-0.855	+0.180	+0.521	83
11.3	-0.359	.	+0.170	+0.420	58	25.3	-0.588	-0.896	+0.150	+0.583	86
12.4	-0.073	.	+0.160	+0.190	51	26.3	-0.580	.	+0.150	+0.576	84
13.4	-0.070	-0.400	+0.159	+0.180	48	30.4	-0.514	-0.647	+0.081	+0.455	73
14.3	-0.577	-0.300	+0.139	+0.342	54	July 1.3	-0.491	.	+0.080	+0.440	71
16.3	-0.310	-0.559	+0.127	+0.339	52	3.4	-0.500	-0.632	+0.080	+0.443	73
19.3	-0.327	.	+0.160	+0.380	56	5.4	-0.520	.	+0.120	+0.500	78
20.3	-0.124	-0.482	+0.170	+0.234	50	6.4	-0.506	-0.795	+0.143	+0.510	80
21.3	-0.249	.	+0.160	+0.330	49	8.3	-0.471	-0.836	+0.173	+0.512	81
23.4	-0.227	-0.524	+0.146	+0.292	51	10.4	-0.491	-0.625	+0.081	+0.437	74
24.3	-0.358	.	+0.137	+0.387	50	11.3	-0.557	.	+0.067	+0.475	80
25.4	-0.410	.	+0.127	+0.418	52	13.3	-0.528	-0.553	+0.038	+0.423	71
26.3	-0.665	.	+0.118	+0.612	61	14.3	-0.532	.	+0.066	+0.454	73
27.3	-0.693	-0.895	+0.108	+0.624	69	15.3	-0.542	-0.709	+0.094	+0.490	75
28.3	-0.738	.	+0.148	+0.703	71	16.3	-0.595	.	+0.106	+0.544	76
29.3	-0.627	-1.030	+0.188	+0.651	77	17.3	-0.522	.	+0.118	+0.498	76
30.3	-0.803	-1.154	+0.167	+0.770	78	18.3	-0.524	-0.780	+0.130	+0.509	77
May 1.3	-0.674	.	+0.123	+0.624	63	21.3	-0.512	.	+0.130	+0.499	78
2.3	-0.557	.	+0.078	+0.486	57	22.3	-0.528	-0.779	+0.128	+0.512	78
3.3	-0.667	+0.683	+0.034	+0.529	60	23.3	-0.548	.	+0.132	+0.533	82
5.3	+0.021	-0.125	+0.086	+0.035	72	25.3	-0.525	-0.805	+0.139	+0.522	80
6.3	-0.027	.	+0.075	+0.062	72	26.3	-0.546	.	+0.129	+0.528	81
14.4	+0.054	+0.136	-0.005	-0.081	59	28.3	-0.516	.	+0.109	+0.479	78
16.3	-0.078	(*)	-0.003	+0.025	59	29.3	-0.528	-0.707	+0.099	+0.484	75
19.5	.	(*)	-0.008	-0.042	61	31.4	-0.590	.	+0.110	+0.550	79
20.4	-0.092	(*)	-0.009	+0.031	63	Aug. 1.3	-0.582	-0.855	+0.136	+0.564	80
26.4	-0.113	.	-0.083	+0.139	68	2.3	-0.650	.	+0.150	+0.630	81
28.4	-0.216	-0.433	+0.114	+0.251	77	3.3	-0.590	-0.912	+0.156	+0.590	83

*Coincidence.

TABLE A.—*Collimation and Level Constants*—Continued

Mean date	M'	M	c_0	b'	Temp.	Mean date	M'	M	c_0	b'	Temp.
1888	r	r	s	s	o	1888	r	r	s	s	o
Aug. 6. 3	—0.593	. .	+0.167	+0.603	86	Oct. 20. 3	+0.589	(*)	+0.262	—0.240	51
7. 3	—0.590	—0.950	+0.171	+0.605	86	21. 3	+0.588	. .	+0.240	—0.260	49
9. 4	—0.590	. .	+0.161	+0.595	81	24. 3	+0.325	—0.073	+0.186	—0.106	56
10. 3	—0.584	. .	+0.157	+0.586	80	28. 3	+0.400	—0.067	+0.213	—0.138	58
11. 3	—0.581	—0.894	+0.152	+0.579	80	29. 3	+0.447	. .	+0.210	—0.180	54
13. 3	—0.596	—0.671	+0.058	+0.497	73	30. 2	+0.404	—0.055	+0.210	—0.144	54
14. 3	—0.606	. .	+0.100	+0.540	77	31. 3	+0.374	. .	+0.210	—0.120	55
15. 3	—0.636	. .	+0.140	+0.610	82	Nov. 1. 3	+0.344	—0.168	+0.231	—0.076	58
16. 3	—0.678	—1.047	+0.174	+0.678	87	3. 3	+0.388	. .	+0.235	—0.107	59
21. 3	—0.613	—0.865	+0.128	+0.580	80	4. 3	+0.353	—0.175	+0.237	—0.077	57
22. 3	—0.511	. .	+0.060	+0.430	69	5. 3	+0.279	. .	+0.240	—0.020	60
23. 3	—0.587	—0.675	+0.063	+0.495	70	6. 2	+0.208	—0.476	+0.299	+0.102	67
24. 3	—0.620	. .	+0.095	+0.553	74	10. 4	+0.623	+0.109	+0.232	—0.296	58
25. 3	—0.590	—0.842	+0.128	+0.562	76	11. 3	+0.848	+0.263	+0.260	—0.447	48
26. 3	—0.593	. .	+0.100	+0.540	78	12. 4	+0.810	. .	+0.260	—0.420	49
28. 3	—0.569	—0.631	+0.052	+0.471	69	13. 3	+0.566	. .	+0.260	—0.220	53
29. 3	—0.560	. .	+0.060	+0.470	75	20. 3	+0.973	+0.412	+0.251	—0.555	43
30. 3	—0.603	. .	+0.070	+0.520	78	21. 3	+1.172	. .	+0.270	—0.694	38
Sept. 2. 3	—0.502	—0.689	+0.102	+0.466	72	22. 3	+1.174	+0.514	+0.290	—0.676	38
5. 4	—0.548	—0.671	+0.077	+0.478	72	23. 4	+1.318	. .	+0.290	—0.790	34
9. 4	—0.480	. .	+0.140	+0.480	73	29. 9	+0.979	+0.453	+0.237	—0.574	.
12. 3	—0.534	—0.929	+0.185	+0.574	75	Dec. 2. 3	+0.980	+0.450	+0.238	—0.573	42
13. 3	—0.080	—0.618	+0.241	+0.271	65	3. 3	+1.159	. .	+0.240	—0.720	38
14. 3	—0.111	—0.656	+0.244	+0.298	67	4. 3	+1.177	. .	+0.240	—0.730	40
19. 3	—0.158	—0.708	+0.246	+0.337	71	5. 4	+0.932	+0.417	+0.232	—0.541	46
21. 3	—0.126	. .	+0.242	+0.308	69	6. 3	+1.207	. .	+0.239	—0.760	.
22. 3	(*)	—0.534	+0.240	+0.206	68	7. 3	—0.061	—0.598	+0.241	+0.255	43
24. 4	+0.098	—0.378	+0.217	+0.106	63	9. 3	(*)	—0.599	+0.227	+0.193	45
26. 3	(*)	—0.464	+0.212	+0.178	65	11. 3	(*)	. .	+0.230	+0.190	45
27. 3	(*)	. .	+0.210	+0.170	65	13. 3	+0.278	—0.286	+0.252	—0.003	33
28. 3	+0.173	—0.267	+0.203	+0.031	58	14. 3	+0.266	. .	+0.250	+0.010	34
29. 3	+0.378	. .	+0.190	—0.140	53	15. 3	+0.100	. .	+0.250	+0.140	37
30. 3	+0.212	—0.171	+0.180	—0.022	56	19. 3	+0.344	—0.220	+0.252	—0.055	33
Oct. 1. 4	(*)	—0.467	+0.213	—0.179	64	20. 3	+0.400	. .	+0.250	—0.100	33
3. 3	+0.299	—0.055	+0.168	—0.103	53	21. 3	+0.127	—0.284	+0.191	+0.056	36
4. 3	+0.120	. .	+0.170	+0.040	56	22. 3	+0.356	. .	+0.159	—0.157	30
5. 3	+0.070	—0.282	+0.168	+0.078	61	23. 2	(*)	—0.247	+0.126	+0.092	40
8. 3	+0.242	. .	+0.197	—0.030	56	24. 2	—0.077	. .	+0.130	+0.160	43
9. 3	+0.451	(*)	+0.206	—0.184	50	25. 3	—0.095	. .	+0.140	+0.180	45
10. 3	(*)	+0.377	+0.178	—0.156	51	26. 3	—0.136	—0.442	+0.149	+0.223	50
14. 3	+0.412	(*)	+0.191	—0.170	53	27. 2	(*)	. .	+0.140	+0.110	47
15. 4	+0.343	. .	+0.203	—0.103	.	28. 2	(*)	. .	+0.130	+0.110	43
17. 3	+0.282	. .	+0.226	—0.032	54	29. 2	—0.119	—0.366	+0.126	+0.186	45
19. 2	+0.169	—0.524	+0.303	+0.135	67	30. 3	—0.094	—0.389	+0.145	+0.186	44

* Coincidence.

TABLE B.—This table gives the azimuths for the corresponding times. The temperatures, as in the preceding table, are of the metal on the west pier.

TABLE B.—*Azimuths*

Date	Sid. Hour	Azimuth	Temp.	Date	Sid. Hour	Azimuth	Temp.	Date	Sid. Hour	Azimuth	Temp.
1888	h	s	°	1888	h	s	°	1888	h	s	°
Jan. 2. 2	0. 17	+ 1. 23	35	March 22. 3	7. 86	+ 1. 53	31	June 1. 3	12. 61	+ 1. 04	69
3. 3	2. 10	+ 1. 40	38	29. 3	7. 69	+ 1. 64	51	3. 3	12. 67	+ 1. 17	63
10. 2	0. 38	+ 1. 31	42	30. 3	7. 71	+ 1. 47	59	4. 3	12. 67	+ 1. 31	68
11. 3	2. 77	+ 1. 12	26	31. 4	10. 53	+ 1. 70	61	5. 3	12. 73	+ 1. 32	73
14. 2	0. 89	+ 1. 26	41					6. 3	12. 75	+ 1. 30	81
16. 3	2. 78	+ 1. 39	32	April 1. 3	8. 38	+ 1. 57	56	7. 3	12. 70	+ 1. 19	75
18. 2	1. 23	+ 1. 01	35	2. 3	8. 44	+ 1. 58	.	8. 4	14. 60	+ 1. 03	71
19. 2	1. 67	+ 1. 09	32	3. 3	8. 44	+ 1. 54	57	9. 3	12. 75	+ 0. 93	77
21. 2	1. 36	+ 0. 99	28	4. 3	8. 44	+ 1. 45	59	12. 3	13. 10	+ 1. 12	71
24. 2	1. 57	+ 1. 04	33	5. 3	9. 24	+ 1. 58	63	13. 4	13. 87	+ 1. 14	72
26. 3	3. 69	+ 1. 45	33	6. 3	8. 62	+ 1. 52	63	14. 3	13. 86	+ 1. 35	78
27. 3	4. 14	+ 1. 06	31	7. 3	8. 49	+ 1. 46	61	15. 3	13. 22	+ 1. 39	83
28. 2	2. 00	+ 1. 42	31	8. 3	8. 20	+ 1. 63	53	16. 4	14. 18	+ 1. 19	80
30. 3	4. 00	+ 1. 39	38	9. 4	10. 11	+ 1. 45	51	17. 3	13. 90	+ 1. 35	83
Feb. 1. 3	4. 27	+ 1. 36	35	11. 3	8. 41	+ 1. 46	58	18. 4	14. 39	+ 1. 25	85
2. 3	3. 87	+ 1. 50	42	12. 4	12. 48	+ 1. 38	51	19. 3	14. 08	+ 1. 25	83
3. 4	5. 52	+ 1. 17	42	13. 3	10. 08	+ 1. 37	48	20. 3	13. 89	+ 1. 30	83
8. 3	4. 09	+ 1. 06	42	14. 3	10. 06	+ 1. 37	54	25. 3	14. 28	+ 1. 34	86
13. 3	4. 86	+ 1. 61	42	16. 3	9. 09	+ 1. 43	52	26. 4	14. 63	+ 1. 23	84
14. 3	4. 86	+ 1. 32	45	19. 3	9. 78	+ 1. 62	56	30. 4	15. 61	+ 1. 02	73
15. 3	3. 87	+ 1. 10	30	20. 3	9. 99	+ 1. 37	50				
16. 3	4. 87	+ 1. 23	31	21. 3	9. 70	+ 1. 37	49	July 1. 3	14. 62	+ 1. 05	71
17. 3	4. 93	+ 1. 42	45	23. 4	11. 78	+ 1. 23	51	3. 4	16. 89	+ 1. 06	73
18. 3	4. 81	+ 1. 36	43	24. 3	9. 69	+ 1. 49	50	5. 4	15. 61	+ 1. 17	78
22. 3	4. 96	+ 1. 48	52	25. 4	11. 27	+ 1. 39	52	6. 4	15. 53	+ 1. 09	80
23. 3	4. 86	+ 1. 45	48	26. 3	9. 74	+ 1. 46	61	8. 3	15. 48	+ 1. 15	81
26. 3	5. 63	+ 1. 41	46	27. 3	9. 82	+ 1. 70	69	10. 4	17. 02	+ 1. 12	74
27. 3	6. 07	+ 1. 27	34	28. 3	9. 74	+ 1. 47	71	11. 3	15. 48	+ 1. 01	80
28. 3	6. 08	+ 1. 62	34	29. 4	10. 93	+ 1. 77	77	13. 3	15. 62	+ 0. 87	71
				30. 3	10. 48	+ 1. 50	78	14. 3	15. 45	+ 0. 92	73
March 3. 3	6. 50	+ 1. 49	46					15. 3	15. 67	+ 1. 12	75
4. 3	6. 52	+ 1. 50	35	May 1. 3	10. 48	+ 1. 64	63	16. 3	15. 58	+ 1. 17	76
6. 3	6. 52	+ 1. 38	30	2. 3	10. 48	+ 1. 39	57	17. 3	15. 55	+ 1. 07	76
7. 3	6. 50	+ 1. 48	36	3. 3	10. 48	+ 1. 34	60	18. 3	15. 70	+ 1. 10	77
8. 3	6. 85	+ 1. 40	40	5. 3	10. 48	+ 1. 32	72	21. 3	15. 90	+ 1. 12	78
9. 3	6. 63	+ 1. 36	43	6. 3	10. 44	+ 1. 37	72	22. 3	15. 90	+ 1. 10	78
12. 3	6. 66	+ 1. 62	33	14. 4	13. 67	+ 1. 04	59	23. 3	15. 90	+ 1. 10	82
14. 3	7. 22	+ 1. 38	39	16. 3	11. 79	+ 0. 90	61	25. 3	15. 90	+ 1. 09	80
15. 3	7. 60	+ 1. 43	42	19. 5	14. 77	+ 0. 95	61	26. 3	15. 90	+ 1. 01	81
17. 3	7. 25	+ 1. 36	44	20. 4	12. 67	+ 1. 03	63	28. 3	15. 90	+ 1. 05	78
18. 3	7. 38	+ 1. 31	42	26. 4	13. 69	+ 1. 14	68	29. 4	17. 39	+ 1. 09	75
21. 3	7. 93	+ 1. 44	56	28. 4	13. 82	+ 1. 23	77	31. 4	17. 56	+ 1. 09	79

TABLE B.—*Azimuths*—Continued

Date	Sid. Hour	Azimuth	Temp.	Date	Sid. Hour	Azimuth	Temp.	Date	Sid. Hour	Azimuth	Temp.
1888	h	s	°	1888	h	s	°	1888	h	s	°
Aug. 1. 3	16. 64	+ 1. 28	80	Sept. 26. 3	19. 69	+ 0. 78	65	Nov. 12. 4	0. 03	+ 0. 97	49
2. 3	16. 67	+ 1. 28	81	27. 3	19. 73	+ 0. 81	65	13. 3	22. 74	+ 0. 95	53
3. 3	16. 64	+ 1. 28	83	28. 3	19. 74	+ 0. 67	58	20. 3	23. 39	+ 1. 17	43
6. 3	17. 02	+ 1. 18	86	29. 3	20. 00	+ 0. 82	53	21. 3	23. 22	+ 1. 03	38
7. 3	16. 97	+ 1. 22	86	30. 3	19. 82	+ 0. 90	56	22. 3	23. 22	+ 0. 89	38
9. 4	18. 24	+ 1. 17	81					23. 4	1. 54	+ 1. 02	34
10. 3	16. 97	+ 1. 07	80	Oct. 1. 4	22. 39	+ 0. 82	64	29. 9	14. 06	+ 0. 98	.
11. 3	16. 97	+ 1. 06	80	3. 3	20. 58	+ 0. 81	53				
13. 3	17. 02	+ 0. 89	73	4. 3	20. 70	+ 0. 64	56	Dec. 2. 3	23. 22	+ 0. 87	43
14. 3	17. 02	+ 0. 99	77	5. 3	20. 70	+ 0. 82	61	3. 3	0. 91	+ 0. 94	38
15. 3	17. 21	+ 1. 03	82	8. 3	21. 10	+ 0. 76	56	4. 3	1. 04	+ 0. 30	40
16. 3	17. 77	+ 1. 05	87	9. 3	20. 66	+ 0. 91	50	5. 4	2. 19	+ 0. 44	46
21. 3	17. 78	+ 1. 07	80	10. 3	20. 97	+ 0. 66	51	6. 3	0. 91	+ 0. 29	.
22. 3	17. 78	+ 0. 95	69	14. 3	21. 39	+ 0. 67	53	7. 3	0. 95	+ 0. 50	43
23. 3	17. 78	+ 1. 03	70	15. 4	23. 03	+ 0. 71	.	9. 3	0. 71	+ 0. 69	45
24. 3	17. 78	+ 1. 06	74	17. 3	21. 30	+ 0. 80	54	11. 3	0. 71	— 0. 40	45
25. 3	17. 78	+ 1. 12	76	19. 2	17. 81	+ 0. 70	67	13. 3	0. 75	— 0. 36	33
26. 3	18. 31	+ 1. 03	78	20. 3	21. 39	+ 0. 78	51	14. 3	0. 85	— 0. 38	34
28. 3	17. 78	+ 0. 99	69	21. 3	20. 93	+ 0. 62	49	15. 3	0. 85	— 0. 33	37
29. 3	18. 08	+ 0. 92	75	24. 3	21. 84	+ 0. 67	56	19. 3	1. 00	— 0. 12	33
30. 3	18. 17	+ 0. 85	78	28. 3	21. 24	+ 0. 78	58	20. 3	0. 95	— 0. 10	33
				29. 3	21. 90	+ 0. 71	54	21. 3	1. 82	— 0. 32	36
Sept. 2. 3	18. 58	+ 0. 99	72	30. 2	18. 34	+ 0. 61	54	22. 3	1. 23	— 0. 07	30
5. 4	20. 09	+ 1. 12	72	31. 3	22. 23	+ 0. 62	55	23. 2	22. 74	— 0. 32	40
9. 4	20. 09	+ 1. 17	73					24. 2	22. 74	— 0. 24	43
12. 3	19. 02	+ 1. 47	75	Nov. 1. 3	22. 24	+ 0. 74	58	25. 3	1. 00	— 0. 23	45
13. 3	18. 94	+ 1. 03	65	3. 3	22. 74	+ 0. 83	59	26. 3	2. 55	— 0. 22	50
14. 3	19. 26	+ 1. 16	67	4. 3	22. 74	+ 0. 71	57	27. 2	23. 05	— 0. 23	47
19. 3	19. 73	+ 1. 08	71	5. 3	22. 74	+ 0. 75	60	28. 2	23. 22	— 0. 26	43
21. 3	19. 69	+ 0. 99	69	6. 2	18. 82	+ 0. 79	67	29. 2	23. 22	— 0. 17	45
22. 3	19. 69	+ 0. 94	68	10. 4	0. 03	+ 0. 90	58	30. 3	0. 95	— 0. 23	44
24. 4	21. 12	+ 0. 88	63	11. 3	22. 74	+ 0. 99	48				

TABLE C.—*Sidereal Clock Corrections and Rates*

Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate	Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate
1888		h	s	s	1888		h	s	s
Jan. 2. 3	L. C. H.	0. 17	— 46. 786	+ 0. 141	Jan. 19. 2	B. W. H.	1. 67	— 47. 438	— 0. 100
3. 3	L. C. H.	2. 10	— 46. 810	+ 0. 066	21. 2	B. W. H.	1. 36	— 48. 026	— 0. 296
10. 2	L. C. H.	0. 38	— 46. 554	+ 0. 037	24. 2	B. W. H.	1. 57	— 48. 448	— 0. 140
11. 3	L. C. H.	2. 77	— 46. 572	— 0. 016	26. 3	L. C. H.	3. 69	— 49. 632	— 0. 567
14. 2	L. C. H.	0. 89	— 46. 972	— 0. 137	27. 3	L. C. H.	4. 14	— 49. 878	— 0. 241
16. 3	B. W. H.	2. 78	— 46. 992	— 0. 010	28. 2	L. C. H.	2. 00	— 50. 240	— 0. 397
18. 2	B. W. H.	1. 23	— 47. 336	— 0. 178	30. 3	B. W. H.	4. 00	— 2. 285	.

TABLE C.—*Sidereal Clock Corrections and Rates*—Continued

Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate	Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate
1888		h	s	s	1888		h	s	s
Feb. 1. 3	B. W. H.	4. 27	— 2. 601	—0. 158	April 14. 3	H. S. C.	10. 06	— 65. 380	—1. 196
2. 3	B. W. H.	3. 87	— 7. 421	.	16. 3	B. W. H.	9. 09	— 67. 422	—1. 042
3. 4	B. W. H.	5. 52	— 7. 758	—0. 315	19. 3	B. W. H.	9. 78	— 70. 219*	—0. 923
8. 3	L. C. H.	4. 09	— 9. 895	—0. 433	20. 3	B. W. H.	9. 99	— 11. 334	—1. 105
13. 3	B. W. H.	4. 86	— 14. 586	—0. 932	21. 3	B. W. H.	9. 70	— 12. 288	—0. 966
14. 3	B. W. H.	4. 86	— 15. 228	—0. 642	23. 4	B. W. H.	11. 78	— 13. 720	—0. 686
15. 3	B. W. H.	3. 87	— 16. 045	—0. 853	24. 3	B. W. H.	9. 69	— 14. 748	—1. 126
16. 3	B. W. H.	4. 87	— 16. 605	—0. 538	25. 4	B. W. H.	11. 27	— 15. 372	—0. 585
17. 3	B. W. H.	4. 93	— 17. 620	—1. 003	26. 3	B. W. H.	9. 74	— 16. 044	—0. 718
18. 3	B. W. H.	4. 81	— 18. 478	—0. 862	27. 3	B. W. H.	9. 82	— 16. 621	—0. 575
22. 3	L. C. H.	4. 96	— 20. 427	—0. 487	28. 3	B. W. H.	9. 74	— 17. 412	—0. 793
23. 3	L. C. H.	4. 86	— 21. 488	—1. 098	29. 4	L. C. H.	10. 93	— 18. 296	—0. 842
26. 3	B. W. H.	5. 63	— 24. 227	—0. 903	30. 3	L. C. H.	10. 48	— 19. 175	—0. 896
27. 3	B. W. H.	6. 07	— 25. 090	—0. 848					
28. 3	B. W. H.	6. 08	— 25. 920	—0. 822	May 1. 3	L. C. H.	10. 48	— 20. 178	—1. 003
March 3. 3	B. W. H.	6. 50	— 28. 530	—0. 650	2. 3	L. C. H.	10. 48	— 21. 128	—0. 950
4. 3	L. C. H.	6. 52	— 29. 522	—0. 991	3. 3	L. C. H.	10. 48	— 22. 068	—0. 940
6. 3	L. C. H.	6. 52	— 31. 549	—1. 014	5. 3	L. C. H.	10. 48	— 23. 706	—0. 819
7. 3	L. C. H.	6. 50	— 32. 380	—0. 832	6. 3	B. W. H.	10. 44	— 24. 650	—0. 946
8. 3	L. C. H.	6. 85	— 33. 285	—0. 892	14. 4	L. C. H.	13. 67	— 28. 160	—0. 431
9. 3	L. C. H.	6. 63	— 34. 228	—0. 951	16. 3	L. C. H.	11. 79	— 29. 645	—0. 773
12. 3	B. W. H.	6. 66	— 37. 312	—1. 028	19. 5	L. C. H.	14. 77	— 30. 844	—0. 384
14. 3	B. W. H.	7. 22	— 39. 135	—0. 901	20. 4	B. W. H.	12. 67	— 31. 122	—0. 304
15. 3	L. C. H.	7. 60	— 39. 710	—0. 566	26. 4	L. C. H.	13. 69	— 33. 905	—0. 461
17. 3	B. W. H.	7. 25	— 41. 080	—0. 690	28. 4	L. C. H.	13. 82	— 34. 216	—0. 115
18. 3	L. C. H.	7. 38	— 42. 026	—0. 941					
21. 3	L. C. H.	7. 93	— 43. 778	—0. 580	June 1. 3	L. C. H.	12. 61	— 34. 856	—0. 182
22. 3	L. C. H.	7. 86	— 44. 557	—0. 781	3. 3	B. W. H.	12. 67	— 36. 523	—0. 832
29. 3	B. W. H.	7. 69	— 48. 897	—0. 621	4. 3	B. W. H.	12. 67	— 37. 560	—1. 040
30. 3	B. W. H.	7. 71	— 49. 302	—0. 405	5. 3	B. W. H.	12. 73	— 38. 578	—1. 013
31. 4	B. W. H.	10. 53	— 49. 957	—0. 586	6. 3	B. W. H.	12. 75	— 39. 145	—0. 567
April 1. 3	L. C. H.	8. 38	— 50. 656	—0. 768	7. 3	B. W. H.	12. 70	— 39. 556	—0. 412
2. 3	L. C. H.	8. 44	— 51. 776	—1. 117	8. 4	B. W. H.	14. 60	— 40. 670	—1. 032
3. 3	L. C. H.	8. 44	— 53. 098	—1. 322	9. 3	B. W. H.	12. 75	— 41. 615	—1. 024
4. 3	L. C. H.	8. 44	— 54. 363	—1. 265	12. 3	L. C. H.	13. 10	— 44. 300	—0. 890
5. 3	L. C. H.	9. 24	— 55. 730	—1. 323	13. 4	L. C. H.	13. 87	— 45. 453	—1. 117
6. 3	L. C. H.	8. 62	— 56. 550	—0. 842	14. 3	L. C. H.	13. 86	— 46. 440	—0. 987
7. 3	B. W. H.	8. 49	— 57. 791	—1. 247	15. 3	L. C. H.	13. 22	— 46. 996	—0. 571
8. 3	B. W. H.	8. 20	— 59. 138	—1. 363	16. 4	L. C. H.	14. 18	— 47. 397	—0. 386
9. 4	H. S. C.	10. 11	— 60. 232	—1. 013	17. 3	B. W. H.	13. 90	— 48. 122	—0. 734
11. 3	H. S. C.	8. 41	— 62. 100	—0. 968	18. 4	L. C. H.	14. 39	— 48. 777	—0. 642
12. 4	H. S. C.	12. 48	— 63. 313	—1. 037	19. 3	B. W. H.	14. 08	— 49. 836	—1. 073
13. 3	H. S. C.	10. 08	— 64. 184	—0. 968	20. 3	B. W. H.	13. 89	— 51. 140	—1. 315
					25. 3	L. C. H.	14. 28	— 56. 436	—1. 056

*Clock set back one minute.

TABLE C.—*Sidereal Clock Corrections and Rates*—Continued

Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate	Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate
1888		h	s	s	1888		h	s	s
June 26.4	B. W. H.	14.63	— 57.746	—1.291	Sept. 2.3	L. C. H.	18.58	.	.
30.4	L. C. H.	15.61	— 62.433	—1.160	5.4	B. W. H.	20.09	— 12.228	—1.156
July 1.3	B. W. H.	14.62	— 63.279	—0.883	9.4	B. W. H.	20.09	— 16.237	—1.002
3.4	B. W. H.	16.89	— 5.250*	—0.941	12.3	B. W. H.	19.02	— 18.753	—0.851
5.4	B. W. H.	15.61	— 6.379	—0.580	13.3	B. W. H.	18.94	— 19.407	—0.656
6.4	B. W. H.	15.53	— 6.870	—0.492	14.3	B. W. H.	19.26	— 20.805	—1.380
8.3	L. C. H.	15.48	— 8.213	—0.672	19.3	B. W. H.	19.73	— 28.156	—1.464
10.4	L. C. H.	17.02	— 10.453	—1.085	21.3	B. W. H.	19.69	— 31.300	—1.574
11.3	L. C. H.	15.48	— 11.405	—1.017	22.3	B. W. H.	19.69	— 33.084	—1.784
13.3	L. C. H.	15.62	— 13.013	—0.802	24.4	B. W. H.	21.12	— 36.976	—1.889
14.3	L. C. H.	15.45	— 14.240	—1.236	26.3	B. W. H.	19.69	— 40.477	—1.805
15.3	B. W. H.	15.67	— 15.393	—1.143	27.3	B. W. H.	19.73	— 41.953	—1.475
16.3	B. W. H.	15.58	— 16.101	—0.711	28.3	B. W. H.	19.74	— 43.432	—1.479
17.3	B. W. H.	15.55	— 16.710	—0.610	29.3	B. W. H.	20.00	— 45.220	—1.770
18.3	B. W. H.	15.70	— 17.493	—0.778	30.3	B. W. H.	19.82	— 46.755	—1.364
21.3	L. C. H.	15.90	— 19.574	—0.692	Oct. 1.4	B. W. H.	22.39	— 48.621	—1.686
22.3	L. C. H.	15.90	— 20.400	—0.826	3.3	B. W. H.	20.58	— 51.329	—1.407
23.3	L. C. H.	15.90	— 21.186	—0.786	4.3	B. W. H.	20.70	— 52.955	—1.618
25.3	L. C. H.	15.90	— 23.366	—1.090	5.3	B. W. H.	20.70	— 54.629	—1.674
26.3	L. C. H.	15.90	— 24.651	—1.285	8.3	B. W. H.	21.10	— 59.762	—1.701
28.3	L. C. H.	15.90	— 27.204	—1.277	9.3	B. W. H.	20.66	— 61.450	—1.719
29.4	L. C. H.	17.39	— 28.578	—1.294	10.3	B. W. H.	20.97	— 62.995	—1.525
31.4	B. W. H.	17.56	— 30.896	—1.155	14.3	L. C. H.	21.39	— 69.228	—1.552
Aug. 1.3	B. W. H.	16.64	— 31.497	—0.625	15.4	L. C. H.	23.03	— 10.722*	—1.399
2.3	B. W. H.	16.67	— 32.293	—0.795	17.3	L. C. H.	21.30	— 13.711	—1.550
3.3	B. W. H.	16.64	— 33.018	—0.726	19.2	L. C. H.	17.81	— 16.606	—1.561
6.3	L. C. H.	17.02	— 35.813	—0.926	20.3	L. C. H.	21.39	— 18.064	—1.269
7.3	L. C. H.	16.97	— 36.816	—1.005	21.3	B. W. H.	20.93	— 19.615	—1.581
9.4	L. C. H.	18.24	— 39.632	—1.372	24.3	B. W. H.	21.84	— 22.975	—1.106
10.3	L. C. H.	16.97	— 41.073	—1.522	28.3	L. C. H.	21.24	— 26.411	—0.864
11.3	L. C. H.	16.97	— 42.451	—1.378	29.3	L. C. H.	21.90	— 27.496	—1.055
13.3	B. W. H.	17.02	— 45.178	—1.362	30.2	L. C. H.	18.34	— 28.792	—1.522
14.3	B. W. H.	17.02	— 46.723	—1.545	31.3	L. C. H.	22.23	— 30.092	—1.120
15.3	B. W. H.	17.21	— 47.915	—1.183	Nov. 1.3	L. C. H.	22.74	— 31.278	—1.142
16.3	B. W. H.	17.77	— 48.887	—0.949	3.3	L. C. H.	22.74	— 32.783	—0.753
21.3	B. W. H.	17.78	— 54.513	—1.125	4.3	L. C. H.	22.74	— 33.995	—1.212
22.3	L. C. H.	17.78	— 55.561	—1.048	5.3	L. C. H.	22.74	— 35.315	—1.320
23.3	L. C. H.	17.78	— 56.978	—1.417	6.2	L. C. H.	18.82	— 36.304	—1.182
24.3	L. C. H.	17.78	— 58.369	—1.391	10.4	L. C. H.	0.03	— 39.728	—0.705
25.3	L. C. H.	17.78	— 59.448	—1.079	11.3	L. C. H.	22.74	— 40.878	—1.216
26.3	B. W. H.	18.31	— 60.498	—1.027	12.4	L. C. H.	0.03	— 42.252	—1.304
28.3	B. W. H.	17.78	— 62.536	—1.030	13.3	L. C. H.	22.74	— 43.407	—1.221
29.3	B. W. H.	18.08	— 63.933	—1.380	20.3	L. C. H.	23.39	— 51.335	—1.128
30.3	B. W. H.	18.17	— 65.20	—1.263	21.3	L. C. H.	23.22	— 52.467	—1.146

*Clock set back one minute.

TABLE C.—*Sidereal Clock Corrections and Rates*—Continued

Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate	Mean Date	Observer	Sidereal Hour	Clock Correction	Daily Rate
1888		h	s	s	1888		h	s	s
Nov. 22.3	L. C. H.	23.22	— 53.227	—0.760	Dec. 14.3	B. W. H.	0.85	— 16.744	—0.845
23.4	L. C. H.	1.54	— 54.445	—1.110	15.3	B. W. H.	0.85	— 17.790	—1.046
29.9	L. C. H.	14.06	— 60.753	—0.967	19.3	L. C. H.	1.00	— 20.697	—0.726
					20.3	L. C. H.	0.95	— 21.521	—0.826
					21.3	L. C. H.	1.82	— 22.538	—0.982
Dec. 2.3	L. C. H.	23.22	— 63.012	—0.948	22.3	L. C. H.	1.23	— 23.432	—1.019
3.3	L. C. H.	0.91	— 64.161	—1.074	23.2	B. W. H.	22.74	— 24.294	—0.970
4.3	L. C. H.	1.04	— 5.093*	—0.927	24.2	B. W. H.	22.74	— 25.294	—1.000
5.4	L. C. H.	2.19	.	.	25.3	B. W. H.	1.00	— 26.380	—0.993
6.3	L. C. H.	0.91	— 7.600	—1.257	26.3	B. W. H.	2.55	— 27.368	—0.928
7.3	L. C. H.	0.95	— 8.808	—1.206	27.2	B. W. H.	23.05	— 27.498	—0.152
9.3	B. W. H.	0.71	— 11.233	—1.219	28.2	B. W. H.	23.22	— 28.132	—0.630
11.3	B. W. H.	0.71	— 13.570	—1.169	29.2	B. W. H.	23.22	— 29.188	—1.056
13.3	B. W. H.	0.75	— 15.896	—1.162	30.3	L. C. H.	0.95	— 30.092	—0.843

* Clock set back one minute.

TABLE D.—This table gives in the *first* column the dates of chronographic comparison of the standard mean time clock with the sidereal observing clock. In each case an observation was secured within a short interval of the comparison.

A reference to Table C will give the correction of the sidereal observing clock at the time of observation.

The *second* column gives the correction of the standard clock also at the time of comparison, while the *third* column gives the daily rate between consecutive corrections.

The *fourth* and *fifth* columns give the mean barometer and temperature of the clock-room for the same interval.

The *sixth* column gives the dates on which the time signals were transmitted over the wires.

The *seventh* column gives the assumed correction to the standard clock at the time of the signal, and the *eighth* column gives the true correction at the same instant.

The *ninth* column gives the difference between the *eighth* and *ninth* columns, or the correction to the signal.

The corrections in the *second* column are for the meridian of the instrument, while in the *eighth* column the corrections have been reduced to the dome of the observatory, 0°.036 west.

TABLE D.—*Corrections and Rates of Standard Mean Time Clock and Record of Time Signals at Noon, Eastern Standard Time [8^m 12^s.09 East of Washington M. T.]*

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
Jan.					Jan.			
2.3	+ 32.91	— 0.067	30.251	64	1.0	.	.	.
3.3	+ 32.95	+ 0.037	30.164	65	2.0	+ 33.00	+ 32.89	— 0.11
					3.0	+ 32.95	+ 32.90	— 0.05
					4.0	+ 33.01	+ 33.02	+ 0.01
					5.0	+ 32.90	+ 33.14	+ 0.24
					6.0	+ 32.90	+ 33.26	+ 0.36
					7.0	+ 33.20	+ 33.38	+ 0.18
					9.0	+ 33.00	+ 33.62	+ 0.62
					10.0	+ 33.00	+ 33.74	+ 0.74
10.2	+ 33.80	+ 0.123	30.142	66	11.0	+ 33.80	+ 33.95	+ 0.15
11.3	+ 34.06	+ 0.237	30.287	.	12.0	+ 34.25	+ 33.88	— 0.37
					13.0	+ 34.55	+ 33.81	— 0.74
					14.0	+ 34.30	+ 34.75	+ 0.45
14.2	+ 34.85	+ 0.271	30.561	66	16.0	+ 35.20	+ 35.03	— 0.17
16.3	+ 35.07	+ 0.107	30.510	64	17.0	+ 35.20	+ 35.21	+ 0.01
					18.0	+ 35.30	+ 35.39	+ 0.09
18.2	+ 35.47	+ 0.207	30.321	62	19.0	+ 35.30	+ 35.63	+ 0.33
19.2	+ 35.73	+ 0.253	30.224	63	20.0	+ 35.75	+ 35.80	+ 0.05
					21.0	+ 35.50	+ 35.97	+ 0.47
21.2	+ 36.04	+ 0.157	30.249	.	23.0	+ 35.90	+ 36.41	+ 0.51
					24.0	+ 36.40	+ 36.62	+ 0.22
24.2	+ 36.71	+ 0.223	30.480	63	25.0	+ 36.85	+ 36.66	— 0.19
					26.0	+ 36.95	+ 36.70	— 0.25
26.3	+ 36.74	+ 0.014	30.064	64	27.0	+ 36.70	+ 36.98	+ 0.28
27.3	+ 37.15	+ 0.403	29.968	64	28.0	+ 37.00	+ 37.17	+ 0.17
28.2	+ 37.22	+ 0.076	30.077	64	30.0	+ 37.20	+ 37.25	+ 0.05
30.3	+ 37.30	+ 0.039	30.097	64	31.0	+ 37.20	+ 37.10	— 0.10
Feb.					Feb.			
1.3	+ 38.11	+ 0.405	30.094	64	1.0	+ 37.35	+ 37.95	+ 0.60
2.3	+ 38.58	+ 0.473	30.421	64	2.0	+ 38.20	+ 38.40	+ 0.20
3.4	+ 39.12	+ 0.509	30.297	65	3.0	+ 38.85	+ 38.90	+ 0.05
					4.0	+ 39.35	+ 39.16	— 0.19
					6.0	+ 40.00	+ 39.66	— 0.34
					7.0	+ 40.30	+ 39.92	— 0.38
					8.0	+ 40.70	+ 40.02	— 0.68
8.3	+ 40.01	+ 0.181	29.940	67	9.0	+ 40.00	+ 40.12	+ 0.12
					10.0	+ 40.20	+ 40.24	+ 0.04
					11.0	+ 40.35	+ 40.32	— 0.03
					13.0	+ 40.30	+ 40.53	+ 0.23

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
Feb. 13.3	+ 40.60	+ 0.118	29.960	65	Feb. 14.0	+ 40.65	+ 40.80	+ 0.25
14.3	+ 40.94	+ 0.341	30.176	66	15.0	+ 41.10	+ 41.16	+ 0.06
15.3	+ 41.29	+ 0.372	30.366	.	16.0	+ 41.45	+ 41.41	— 0.04
16.3	— 23.10*	.	30.607	.	17.0	— 23.00	— 23.21	— 0.21
17.3	— 23.20	— 0.101	30.077	66	18.0	— 23.10	— 23.15	— 0.05
18.3	— 23.08	+ 0.120	29.980	.	20.0	— 22.90	— 22.60	+ 0.30
					21.0	— 22.80	— 22.32	+ 0.48
					22.0	— 22.30	— 22.04	+ 0.26
22.3	— 21.92	+ 0.291	30.149	.	23.0	— 21.85	— 21.61	+ 0.24
23.3	— 21.44	+ 0.481	30.282	67	24.0	— 21.20	— 21.38	— 0.18
					25.0	— 20.90	— 21.16	— 0.26
26.3	— 20.91	+ 0.175	29.878	67	27.0	— 20.60	— 20.71	+ 0.11
27.3	— 20.56	+ 0.347	29.923	67	28.0	— 20.40	— 20.38	+ 0.02
28.3	— 20.25	+ 0.311	30.358	65	29.0	— 20.15	— 20.09	+ 0.06
					March 1.0	— 20.00	— 19.81	+ 0.19
March 3.3	— 19.11	+ 0.285	30.253	.	2.0	— 19.75	— 19.52	+ 0.23
4.3	— 18.87	+ 0.241	30.216	66	3.0	— 19.40	— 19.24	+ 0.16
6.3	— 18.34	+ 0.265	29.995	65	5.0	— 18.80	— 18.98	— 0.18
7.3	— 18.10	+ 0.240	30.062	64	6.0	— 18.50	— 18.72	+ 0.22
8.3	— 17.82	+ 0.276	30.158	67	7.0	— 18.30	— 18.46	— 0.16
9.3	— 17.43	+ 0.388	30.397	66	8.0	— 18.10	— 18.21	— 0.11
12.3	— 16.79	+ 0.215	30.174	64	9.0	— 17.70	— 17.95	— 0.25
					10.0	— 17.15	— 17.59	— 0.44
14.3	— 16.63	+ 0.079	29.911	.	12.0	— 16.65	— 17.12	— 0.47
15.3	— 16.22	+ 0.404	30.257	65	13.0	— 16.70	— 16.89	— 0.29
					14.0	— 16.70	— 16.79	— 0.09
17.3	— 15.71	+ 0.259	29.934	66	15.0	— 16.50	— 16.69	— 0.19
18.3	— 15.21	+ 0.498	30.072	65	16.0	— 16.10	— 16.39	— 0.29
					17.0	— 16.00	— 15.83	+ 0.17
21.3	— 14.50	+ 0.235	29.906	67	19.0	— 15.15	— 14.61	+ 0.54
22.3	— 14.25	+ 0.251	29.821	65	20.0	— 14.65	— 14.37	+ 0.28
					21.0	— 14.45	— 14.13	+ 0.32
					22.0	— 14.50	— 13.89	+ 0.61
					23.0	— 14.00	— 13.65	+ 0.35
					24.0	— 13.70	— 13.41	+ 0.29

* Clock set ahead one minute.

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison		Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal	
1888		s	s	in	°	1888	s	s	s	
	March	26.0	— 13.00	— 12.93	+ 0.07					
		27.0	— 12.70	— 12.69	+ 0.01					
		28.0	— 12.60	— 12.45	+ 0.15					
		29.0	— 12.60	— 12.21	+ 0.39					
		30.0	— 11.95	— 11.90	+ 0.05					
		31.0	— 11.55	— 11.80	— 0.25					
	April	2.0	— 11.35	— 11.40	— 0.05					
		3.0	— 11.25	— 11.04	+ 0.21					
		4.0	— 10.75	— 10.60	+ 0.15					
		5.0	— 10.25	— 10.42	— 0.17					
		6.0	— 10.35	— 10.23	+ 0.12					
		7.0	— 9.95	— 9.95	0.0					
		9.0	— 9.50	— 9.16	+ 0.34					
		10.0	— 8.70	— 8.82	— 0.12					
		11.0	— 8.40	— 8.49	— 0.09					
		12.0	— 8.20	— 8.28	— 0.08					
		13.0	— 8.10	— 7.87	+ 0.23					
		14.0	— 7.60	— 7.56	+ 0.04					
		16.0	— 7.05	— 7.13	— 0.08					
		17.0	— 6.90	— 6.83	+ 0.07					
		18.0	— 6.70	— 6.53	+ 0.17					
		19.0	— 5.50	— 6.23	— 0.73					
		20.0	— 5.85	— 6.01	— 0.16					
		21.0	— 5.85	— 5.80	+ 0.05					
		23.0	— 5.35	— 5.31	+ 0.04					
		24.0	— 5.05	— 5.37	— 0.32					
		25.0	— 5.20	— 5.19	+ 0.01					
		26.0	— 4.80	— 4.85	+ 0.05					
		27.0	— 4.60	— 4.47	+ 0.13					
		28.0	— 4.10	— 4.16	— 0.06					
		30.0	— 3.55	— 3.54	+ 0.01					
		1.0	— 3.30	— 3.12	+ 0.18					
		2.0	— 2.85	— 2.67	+ 0.18					
	May	1.0	— 2.92	+ 0.490	29.813	75				
		2.0	— 2.49	+ 0.432	30.069	70				

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
May 3.3	— 2.04	+ 0.452	30.247	67	May 3.0	— 2.55	— 2.22	+ 0.33
					4.0	— 1.80	— 1.72	+ 0.08
5.3	— 1.61	+ 0.216	30.103	70	5.0	— 1.55	— 1.65	— 0.10
6.3	— 1.48	+ 0.131	30.238	72	. .	. .	— 1.56	. .
					7.0	— 1.40	— 1.43	— 0.03
					8.0	— 1.25	— 1.30	— 0.05
					9.0	— 1.0.	— 1.17	— 0.17
					10.0	— 1.00	— 1.04	— 0.04
					11.0	— 0.85	— 0.91	— 0.06
					12.0	— 0.75	— 0.78	— 0.03
					14.0	— 0.60	— 0.50	+ 0.10
14.4	+ 0.65	+ 0.263	29.983	73	15.0	+ 0.55	+ 0.12	— 0.43
16.3	+ 0.80	+ 0.078	29.995	.	16.0	+ 1.00	+ 0.74	— 0.26
					17.0	+ 0.90	+ 0.77	— 0.13
					18.0	+ 0.90	+ 0.79	— 0.11
19.5	+ 0.86	+ 0.019	30.132	75	19.0	+ 1.05	+ 0.82	— 0.23
20.4	+ 0.93	+ 0.077	30.341	77	. .	. .	+ 0.87	. .
					21.0	+ 1.00	+ 0.93	— 0.07
					22.0	+ 1.20	+ 0.98	— 0.22
					23.0	+ 1.35	+ 1.04	— 0.31
					24.0	+ 1.45	+ 1.09	— 0.36
					25.0	+ 1.50	+ 1.15	— 0.35
					26.0	+ 1.60	+ 1.21	— 0.39
26.4	+ 1.27	+ 0.056	30.021	67	28.0	+ 1.70	+ 1.17	— 0.53
28.4	+ 1.19	— 0.040	29.881	74	29.0	+ 1.20	+ 1.16	— 0.04
					30.0	+ 1.25	+ 1.15	— 0.10
					31.0	+ 1.25	+ 1.15	— 0.10
June 1.3	+ 1.18	— 0.003	29.870	77	June 1.0	+ 1.35	+ 1.14	— 0.21
3.3	+ 1.14	— 0.020	29.946	73	2.0	+ 1.20	+ 1.12	— 0.08
4.3	+ 1.34	+ 0.201	30.143	71	. .	. .	+ 1.11	. .
5.3	+ 1.26	— 0.080	30.255	70	4.0	+ 1.15	+ 1.24	+ 0.09
6.3	+ 1.32	+ 0.060	30.152	75	5.0	+ 1.60	+ 1.25	— 0.35
7.3	+ 1.97	+ 0.652	30.056	78	6.0	+ 1.80	+ 1.26	— 0.54
8.4	+ 2.62	+ 0.600	30.158	76	7.0	+ 1.30	+ 1.73	+ 0.43
9.3	+ 2.82	+ 0.219	30.130	76	8.0	+ 1.80	+ 2.34	+ 0.54
					9.0	+ 2.90	+ 2.72	— 0.18
					11.0	+ 2.90	+ 2.88	— 0.02
12.3	+ 3.17	+ 0.116	29.973	75	12.0	+ 2.85	+ 3.10	+ 0.25
					13.0	+ 3.20	+ 3.26	+ 0.06

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888		s	in	°	1888	s	s	s
June 13.4	+ 3.36	+ 0.184	30.204	73	June 14.0	+ 3.60	+ 3.27	— 0.33
14.3	+ 3.28	— 0.081	30.062	76	15.0	+ 3.50	+ 3.27	— 0.23
15.3	+ 3.32	+ 0.041	29.968	79	16.0	+ 3.20	+ 3.37	+ 0.17
16.4	+ 3.45	+ 0.125	29.889	81	. .	. .	+ 3.39	. .
17.3	+ 3.42	— 0.030	29.926	82	18.0	+ 3.35	+ 3.59	+ 0.24
18.4	+ 3.74	+ 0.316	29.899	.	19.0	+ 3.85	+ 3.86	+ 0.01
19.3	+ 3.98	+ 0.246	29.997	83	20.0	+ 4.05	+ 4.17	+ 0.12
20.3	+ 4.32	+ 0.340	29.944	83	21.0	+ 4.55	+ 4.30	— 0.25
					22.0	+ 4.40	+ 4.44	+ 0.04
					23.0	+ 4.50	+ 4.57	+ 0.07
					25.0	+ 4.65	+ 4.84	+ 0.19
25.3	+ 4.92	+ 0.120	29.853	84	26.0	+ 4.95	+ 5.02	+ 0.07
26.4	+ 5.13	+ 0.206	29.857	.	27.0	+ 5.20	+ 5.06	— 0.14
					28.0	+ 5.45	+ 5.10	— 0.35
					29.0	+ 5.55	+ 5.15	— 0.40
					30.0	+ 5.70	+ 5.19	— 0.51
July 30.4	+ 5.23	+ 0.025	30.017	77	. .	. .	+ 5.04	. .
1.3	+ 4.99	— 0.251	29.959	74	July 2.0	+ 4.80	+ 5.10	+ 0.30
					3.0	+ 5.00	+ 5.15	+ 0.15
3.4	+ 5.24	+ 0.119	30.176	73	4.0	+ 5.40	+ 5.15	— 0.25
					5.0	+ 5.45	+ 5.15	— 0.30
5.4	+ 5.16	— 0.041	30.061	77	6.0	+ 5.20	+ 5.21	+ 0.01
6.4	+ 5.29	+ 0.131	30.065	79	7.0	+ 5.25	+ 5.33	+ 0.08
8.3	+ 5.54	+ 0.126	30.027	82	. .	. .	+ 5.46	. .
					9.0	+ 5.60	+ 5.54	— 0.06
10.4	+ 5.68	+ 0.068	29.939	79	10.0	+ 5.60	+ 5.62	+ 0.02
11.3	+ 5.54	— 0.150	29.894	77	11.0	+ 5.65	+ 5.55	— 0.10
					12.0	+ 5.40	+ 5.53	+ 0.13
13.3	+ 5.55	+ 0.005	29.823	79	13.0	+ 5.20	+ 5.51	+ 0.31
14.3	+ 5.50	— 0.050	30.069	75	14.0	+ 5.60	+ 5.48	— 0.12
15.3	+ 5.23	— 0.267	30.108	76	. .	. .	+ 5.28	. .
16.3	+ 5.27	+ 0.041	30.137	76	16.0	+ 5.20	+ 5.22	+ 0.02
17.3	+ 5.43	+ 0.160	30.208	75	17.0	+ 5.35	+ 5.24	— 0.11
18.3	+ 5.55	+ 0.121	30.205	76	18.0	+ 5.60	+ 5.47	— 0.13
					19.0	+ 5.60	+ 5.53	— 0.07
					20.0	+ 5.50	+ 5.59	+ 0.09
					21.0	+ 5.55	+ 5.65	+ 0.10

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
July 21.3	+ 5.70	+ 0.050	30.113	77	July . .	. .	+ 5.62	. .
22.3	+ 5.64	— 0.060	30.073	78	23.0	+ 5.65	+ 5.63	— 0.02
23.3	+ 5.67	+ 0.030	30.045	79	24.0	+ 5.65	+ 5.72	+ 0.07
25.3	+ 5.89	+ 0.110	30.092	81	25.0	+ 5.70	+ 5.82	+ 0.12
26.3	+ 6.23	+ 0.340	30.083	79	26.0	+ 6.00	+ 6.09	+ 0.09
28.3	+ 6.45	+ 0.110	30.079	79	27.0	+ 6.35	+ 6.23	— 0.12
29.4	+ 6.44	— 0.009	30.210	77	28.0	+ 6.30	+ 6.38	+ 0.08
31.4	+ 6.06	— 0.190	30.082	76	. .	. .	+ 6.41	. .
Aug. 1.3	+ 6.03	— 0.031	29.991	79	30.0	+ 6.45	+ 6.25	— 0.20
2.3	+ 5.89	— 0.140	30.069	79	31.0	+ 6.45	+ 6.09	— 0.36
3.3	+ 5.97	+ 0.080	30.046	81	Aug. 1.0	+ 6.00	+ 6.00	0.00
6.3	+ 5.68	— 0.097	29.896	84	2.0	+ 6.05	+ 5.90	— 0.15
7.3	+ 5.70	+ 0.020	29.947	86	3.0	+ 5.85	+ 5.91	+ 0.06
9.4	+ 5.79	+ 0.044	30.011	87	4.0	+ 6.00	+ 5.83	— 0.17
10.3	+ 5.93	+ 0.148	30.222	83	6.0	+ 6.00	+ 5.68	— 0.32
11.3	+ 6.06	+ 0.130	30.265	81	7.0	+ 5.60	+ 5.66	+ 0.06
13.3	+ 5.86	— 0.100	30.095	79	8.0	+ 5.65	+ 5.70	+ 0.05
14.3	+ 5.67	— 0.191	30.191	76	9.0	+ 5.60	+ 5.74	+ 0.14
15.3	+ 5.43	— 0.240	30.148	78	10.0	+ 5.75	+ 5.85	+ 0.10
16.3	+ 5.29	— 0.136	30.133	83	11.0	+ 5.95	+ 5.98	+ 0.03
21.3	+ 4.66	— 0.126	30.008	81	13.0	+ 6.10	+ 5.86	— 0.14
22.3	+ 4.52	— 0.141	29.907	77	14.0	+ 5.90	+ 5.69	— 0.21
23.3	+ 4.61	+ 0.090	30.189	74	15.0	+ 5.70	+ 5.47	— 0.23
24.3	+ 4.48	— 0.131	30.162	73	16.0	+ 5.55	+ 5.30	— 0.25
25.3	+ 4.23	— 0.250	30.110	75	17.0	+ 5.30	+ 5.17	— 0.13
26.3	+ 4.19	— 0.039	30.085	76	18.0	+ 5.30	+ 5.04	— 0.26
28.3	+ 3.99	— 0.102	30.062	75	20.0	+ 5.25	+ 4.79	— 0.46
					21.0	+ 5.55	+ 4.66	— 0.89
					22.0	+ 4.60	+ 4.53	— 0.07
					23.0	+ 4.35	+ 4.55	+ 0.20
					24.0	+ 4.65	+ 4.49	— 0.16
					25.0	+ 4.60	+ 4.27	— 0.33
					. .	. .	+ 4.17	. .
					27.0	+ 4.00	+ 3.98	— 0.02
					28.0	+ 3.80	+ 3.84	+ 0.04

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
Aug. 29.3	+ 3.82	— 0.168	30.048	73	Aug. 29.0	+ 3.90	+ 3.67	— 0.23
30.3	+ 3.65	— 0.171	29.996	75	30.0	+ 3.75	+ 3.58	— 0.17
Sept. 2.3	+ 3.33	— 0.106	29.988	76	31.0	+ 3.55	+ 3.50	— 0.05
5.4	+ 2.82	— 0.167	30.156	.	Sept. 1.0	+ 3.40	+ 3.41	+ 0.01
9.4	+ 2.05	— 0.193	30.256	.	. .	. .	+ 3.33	. .
12.3	+ 1.44	— 0.207	29.997	69	3.0	+ 3.30	+ 3.16	— 0.14
13.3	+ 1.88	+ 0.411	30.019	73	4.0	+ 3.20	+ 3.00	— 0.20
14.3	+ 1.98	+ 0.099	30.199	.	5.0	+ 3.05	+ 2.85	— 0.20
19.3	+ 0.74	— 0.248	30.064	71	6.0	+ 2.70	+ 2.66	— 0.04
21.3	+ 0.41	— 0.166	30.074	73	7.0	+ 2.60	+ 2.46	— 0.14
22.3	+ 0.33	— 0.080	30.115	72	8.0	+ 2.40	+ 2.27	— 0.13
24.4	— 0.03	— 0.175	30.161	69	. .	. .	+ 2.08	. .
26.3	— 0.80	— 0.398	29.856	65	10.0	+ 2.10	+ 1.88	— 0.22
27.3	— 1.18	— 0.379	29.826	66	11.0	+ 1.95	+ 1.68	— 0.27
28.3	— 1.45	— 0.270	30.024	65	12.0	+ 1.80	+ 1.47	— 0.33
29.3	— 1.72	— 0.269	30.122	62	13.0	+ 1.30	+ 1.72	+ 0.42
30.3	— 1.98	— 0.263	30.112	59	14.0	+ 1.80	+ 1.91	+ 0.11
Oct. 1.4	— 2.57	— 0.536	29.775	63	15.0	+ 2.05	+ 1.68	— 0.37
3.3	— 3.20	— 0.328	29.822	62	17.0	+ 2.30	+ 1.23	— 1.07
4.3	— 3.39	— 0.189	30.144	63	18.0	+ 2.45	+ 1.01	— 1.44
5.3	— 3.73	— 0.341	30.064	63	19.0	+ 2.55	+ 0.78	— 1.77
8.3	— 4.87	— 0.377	29.758	66	20.0	+ 0.60	+ 0.60	0.00
9.3	— 4.97	— 0.107	29.859	62	21.0	+ 0.30	+ 0.43	+ 0.13
					22.0	+ 0.20	+ 0.32	+ 0.12
					24.0	+ 0.15	0.00	— 0.15
					25.0	— 0.20	— 0.36	— 0.16
					26.0	— 0.60	— 0.72	— 0.12
					27.0	— 1.15	— 1.10	+ 0.05
					28.0	— 1.00	— 1.40	— 0.40
					29.0	— 1.65	— 1.67	— 0.02
					. .	. .	— 1.94	. .
					Oct. 1.0	— 2.20	— 2.39	— 0.19
					2.0	— 2.95	— 2.76	+ 0.19
					3.0	— 3.40	— 3.13	+ 0.17
					4.0	— 3.45	— 3.37	+ 0.08
					5.0	— 3.55	— 3.66	— 0.11
					6.0	— 4.05	— 4.03	+ 0.02
					8.0	— 4.80	— 4.78	+ 0.02
					9.0	— 5.00	— 4.97	+ 0.03

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
Oct. 10.3	— 5.15	— 0.178	30.032	62	Oct. 10.0	— 5.15	— 5.13	+ 0.02
					11.0	— 5.30	— 5.46	— 0.16
					12.0	— 5.80	— 5.79	+ 0.11
					13.0	— 6.10	— 6.12	— 0.02
14.3	— 6.51	— 0.340	29.806	60	. .	. .	— 6.44	. .
15.4	— 6.73	— 0.204	30.090	.	15.0	— 6.75	— 6.68	+ 0.07
					16.0	— 6.75	— 6.88	— 0.13
17.3	— 7.09	— 0.189	30.039	63	17.0	— 7.20	— 7.07	+ 0.13
					18.0	— 7.15	— 7.21	— 0.06
19.2	— 7.34	— 0.135	30.209	63	19.0	— 7.25	— 7.35	— 0.10
20.3	— 7.28	+ 0.052	29.898	66	20.0	— 7.50	— 7.33	+ 0.17
21.3	— 7.30	— 0.020	30.220	63	. .	. .	— 7.33	. .
					22.0	— 7.40	— 7.27	+ 0.13
					23.0	— 7.55	— 7.22	+ 0.33
24.3	— 7.10	+ 0.066	30.148	61	24.0	— 7.75	— 7.16	+ 0.59
					25.0	— 7.10	— 7.13	— 0.03
28.3	— 7.00	+ 0.025	30.183	63	26.0	— 7.00	— 7.10	— 0.10
29.3	— 7.02	— 0.020	30.087	61	27.0	— 6.90	— 7.07	— 0.03
30.2	— 7.17	— 0.176	30.191	62	. .	. .	— 7.04	. .
31.3	— 6.74	+ 0.372	30.365	62	29.0	— 7.00	— 7.05	— 0.05
Nov. 1.3	— 6.76	— 0.020	30.340	63	30.0	— 7.00	— 7.18	— 0.18
					31.0	— 7.15	— 6.89	+ 0.26
3.3	— 6.77	— 0.005	30.064	66	Nov. 1.0	— 6.70	— 6.79	— 0.07
4.3	— 6.65	+ 0.120	30.270	64	2.0	— 6.80	— 6.79	+ 0.01
5.3	— 6.54	+ 0.110	30.266	64	3.0	— 6.90	— 6.80	+ 0.10
6.2	— 6.83	— 0.344	30.064	66	. .	. .	— 6.73	. .
					5.0	— 6.60	— 6.61	— 0.01
10.4	— 6.67	+ 0.038	29.990	68	6.0	— 6.50	— 6.81	— 0.31
11.3	— 6.90	— 0.244	29.945	67	7.0	— 6.80	— 6.79	+ 0.01
12.4	— 6.90	— 0.000	30.296	62	8.0	— 6.80	— 6.77	+ 0.03
13.3	— 6.94	— 0.043	30.498	61	9.0	— 7.15	— 6.75	+ 0.40
					10.0	— 7.40	— 6.72	— 0.32
					. .	. .	— 6.86	. .
					12.0	— 7.00	— 6.94	+ 0.06
					13.0	— 6.80	— 6.96	— 0.16
					14.0	— 7.05	— 7.13	— 0.08
					15.0	— 7.10	— 7.31	— 0.21
					16.0	— 7.20	— 7.48	— 0.28
					17.0	— 7.20	— 7.66	— 0.46
					19.0	— 7.20	— 8.00	— 0.80
					20.0	— 7.90	— 8.18	— 0.28

TABLE D.—*Corrections and Rates of Standard Mean Time Clock, etc.*—Continued

Date of Comparison	Correction to Standard Mean Time Clock	Daily Rate	Mean Barometer	Mean Temp.	Date of Signal	Correction to Standard assumed	Correction to Standard	Correction to Signal
1888	s	s	in	°	1888	s	s	s
Nov. 20.3	— 8.20	— 0.180	30.266	59	Nov. 21.0	— 8.30	— 8.20	+ 0.10
21.3	— 8.15	+ 0.051	30.513	56	22.0	— 8.00	— 8.14	— 0.14
22.3	— 8.09	+ 0.060	30.428	54	23.0	— 8.05	— 8.15	— 0.10
23.4	— 8.16	— 0.064	30.576	53	24.0	— 8.20	— 8.43	— 0.23
					26.0	— 8.50	— 8.99	— 0.49
					27.0	— 8.90	— 9.27	— 0.37
					28.0	— 9.15	— 9.56	— 0.41
					29.0	— 9.40	— 9.84	— 0.44
29.9	— 10.07	— 0.293	29.888	53	30.0	— 10.10	— 9.99	+ 0.11
Dec. 2.3	— 10.31	— 0.101	30.039	53	Dec. 1.0	— 10.30	— 10.15	+ 0.15
3.3	— 10.47	— 0.150	30.103	54	3.0	— 10.40	— 10.46	— 0.06
4.3	— 10.49	— 0.020	29.968	56	4.0	— 10.60	— 10.52	+ 0.08
5.4	— 10.87	— 0.374	29.728	.	5.0	— 10.50	— 10.76	— 0.26
6.3	— 10.88	— 0.01	29.985	56	6.0	— 10.90	— 10.91	— 0.01
7.3	— 10.86	+ 0.021	30.214	.	7.0	— 10.80	— 10.90	— 0.10
9.3	— 11.18	— 0.161	30.048	56	8.0	— 10.95	— 11.03	— 0.08
					. . .	. . .	— 11.17	. . .
11.3	— 11.58	— 0.200	29.883	55	10.0	— 11.30	— 11.38	— 0.08
					11.0	— 11.45	— 11.55	— 0.10
13.3	— 12.18	— 0.301	29.952	56	12.0	— 11.75	— 11.83	— 0.08
14.3	— 12.08	+ 0.110	30.217	53	13.0	— 11.90	— 12.12	— 0.22
15.3	— 12.07	0.000	30.514	52	14.0	— 12.45	— 12.14	+ 0.31
					15.0	— 11.95	— 12.11	— 0.16
19.3	— 12.66	— 0.148	29.805	55	17.0	— 12.35	— 12.39	— 0.04
20.3	— 12.49	+ 0.170	30.302	.	18.0	— 12.50	— 12.53	— 0.03
21.3	— 12.58	— 0.088	30.077	49	19.0	— 12.60	— 12.66	— 0.06
22.3	— 12.69	— 0.113	30.447	47	20.0	— 12.75	— 12.58	+ 0.17
23.2	— 12.90	— 0.235	30.586	50	21.0	— 12.45	— 12.59	— 0.14
24.2	— 12.99	— 0.090	30.416	50	22.0	— 12.55	— 12.69	— 0.14
25.3	— 13.06	— 0.066	30.320	53	24.0	— 13.05	— 12.99	+ 0.06
26.3	— 13.06	0.000	30.193	51	25.0	— 13.10	— 13.08	+ 0.02
27.2	— 13.09	— 0.036	29.775	60	26.0	— 13.10	— 13.10	0.00
28.2	— 13.11	— 0.020	30.104	58	27.0	— 13.15	— 13.09	+ 0.06
29.2	— 13.08	+ 0.030	30.444	58	28.0	— 13.20	— 13.14	+ 0.06
30.3	— 12.69	+ 0.365	30.586	57	29.0	— 12.60	— 13.12	— 0.52
					31.0	— 12.55	— 12.93	— 0.38

THE 26-INCH EQUATORIAL

The observations with this instrument are printed on pages B.45-52, and the results are given on pages C.21-30

The measurements of angles of positions and distances were made in the following manner: In the case of a double star the wires were separated a convenient distance, and the stars were placed midway between them. The position circle was turned until the line joining the stars was parallel to the wires, and then the vernier was read. After this reading the circle was moved backward and forward thirty or forty degrees and another setting was made. Four such readings were taken for an observation of the angle. Two double distances were then measured, the wires being reversed between the measures, and this completed the observation of a star.

In the case of Hyperion, the faint satellite of Saturn, the disk of the planet and the satellite were bisected by a single wire, and single distances were measured from the coincidence of the wires. This was done also with the satellites of Mars. The observations of satellites have been corrected for differential refraction, and in the case of the Mars satellites for the figure of the disk.

Some conjunctions of the inner satellites of Saturn with the apparent minor axis of the ring will be found on page C.22

The value of a revolution of the micrometer used in the reduction is

$$R = 9''.9479$$

The weights were estimated, as usual, on a scale of 5, 1 denoting an extremely poor condition of the images and 5 a perfect condition.

The observations were made by Professor A. HALL.

THE 9.6-INCH EQUATORIAL

This instrument was in charge of Professor EDGAR FRISBY, and was used in the observation of comets, asteroids, and occultations of stars by the Moon.

The observations were made with a filar micrometer, in the same manner as described in previous volumes. There are five wires for determining differences of right-ascension, whose equatorial intervals are about 6^s apart, and the same number for determining difference of declination.

The wires are numbered from the micrometer head in the order 1, 2, 3, 4, 5, the intervals as determined from observations of Polaris and its companion being, in seconds of arc,

$$\begin{aligned} 2 - 1 &= 257.95 \\ 3 - 2 &= 199.47 \\ 4 - 3 &= 200.77 \\ 5 - 4 &= 261.92 \end{aligned}$$

and the value of one revolution of the micrometer screw being $15''.327$

The magnifying power used was 132.

The results are printed upon pages C.31-35, the first two columns giving the time of observation and the observer, F. denoting Professor FRISBY, T. Mr. H. P. TUTTLE, and W. Assistant Astronomer W. C. WINLOCK. The next four columns give the comparison star, the number of comparisons, and the differences of right ascension and of declination, corrected for differential refraction. The last four columns give the resulting apparent places of the comet or asteroid and the logarithms of the parallax factors in right-ascension and declination, the former for seconds of time and the latter for seconds of arc.

The comparison stars have been invariably reduced from the epoch of the catalogue to the commencement of the year of observation by precession, and thence to the date of observation by means of the constants in the American Ephemeris.

ASTRONOMICAL

OBSERVATIONS AND REDUCTIONS

1888

TRANSIT CIRCLE
OBSERVATIONS AND REDUCTIONS
1888

JANUARY 1 TO MARCH 19
Clamp WEST

JUNE 17 TO DECEMBER 31
Clamp EAST

SUMMARY OF THE PRINCIPAL CONSTANTS USED IN THE REDUCTIONS

Approximate equatorial interval between any two of the consecutive threads, I, II, III, IV, V, VI, VII	12 ^s .25
One revolution of microscope micrometers	30''
One revolution of zenith-distance micrometer	15'''.312
One revolution of right-ascension micrometer	1 ^s .024

Corrections for Inclination and Distance of Declination Threads

January 1 to March 19, 1888: Clamp West					June 17 to December 31, 1888: Clamp East			
Vertical Thread	Correction for Double Threads	Correction for Thread A	Correction for Thread B	Correction for Thread b	Correction for Double Threads	Correction for Thread A	Correction for Thread B	Correction for Thread b
I	— 0.41	— 2 31.79	+ 2 34.30	+ 2 54.26	— 0.66	+ 2 30.80	— 2 34.84	— 2 56.10
II	.28	31.99	34.10	54.41	.44	31.10	34.59	55.58
III	— .14	32.19	33.89	54.57	.22	31.40	34.33	55.06
IV	.00	32.39	33.69	54.72	.00	31.70	34.08	54.54
V	+ .14	32.59	33.49	54.87	.22	32.00	33.83	54.02
VI	.28	32.79	33.28	55.03	.44	32.30	33.57	53.50
VII	+ 0.41	— 2 32.99	+ 2 33.08	+ 2 55.18	— 0.66	+ 2 32.60	— 2 33.32	— 2 52.98

Constant { added to reduction to meridian . . . }	1'''.80
Constant { subtracted from zenith-point correction }	
Adopted latitude of the Transit Circle	38° 53' 38'''.80
Position of the instrument from January 1 to March 19, 1888	Clamp West
Position of the instrument from June 18 to December 31, 1888	Clamp East

As usual, Circle B was used in observing in 1888. From January 1 to March 19 Circle B was on the east end of the axis; from June 18 to December 31 it was on the west end of the axis. In the first position the reading of the horizontal microscope when the telescope pointed to the zenith was 53° 4'; in the second position the reading was 55° 0'.

In reversing the instrument the notation of the vertical threads is also changed, so that the first thread reached by an equatorial star is always called Thread I.

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD		CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction							
					Inst.	Clock	Instrument	Refraction														
January 3, S.					m.	s.	s.	s.	°	'	"	h.	m.	s.	s.	°	'	"	"			
	1	Venus II, S.	9	52	38.50	— 0.51	— 25.20	56	20	4.25	+ 3	20.61	+ 1	31.3	15	52	12.79	— 0.65	107	31	17.4	. .
	2	β Scorpii	9	59	19.42	— 0.53	— 25.20	58	18	8.98	+ 3	32.61	+ 1	38.5	15	58	53.69	. .	109	29	41.3	— 1.5
	3	δ Ophiuchi	9	8	52.37	— 0.36	— 25.21	42	14	8.18	+ 2	46.18	+ .	55.3	16	8	26.81	. .	93	24	10.9	— 1.3
	4	τ Herculis	9	16	45.13	+ 0.37	— 25.20	352	16	. .	. .	. .	. .	. .	16	16	20.30	. .	43	25	. .	. .
10, W.	5	Weisse (2) 245	9	13	8.07	+ 0.16	— 24.71	359	32	5.28	+ 2	23.39	—	0.4	2	12	43.52	+ 0.08	50	40	49.5	+ 3.0
	6	Weisse (2) 314	9	16	9.98	+ 0.16	— 24.70	359	32	5.28	+ 2	18.56	—	0.4	2	15	45.44	+ 0.06	50	40	44.6	+ 2.9
	7	Weisse (2) 360	9	17	45.79	+ 0.16	— 24.70	359	32	5.28	+ 2	18.48	—	0.4	2	17	21.25	+ 0.05	50	40	44.6	+ 2.9
	8	Bonn VI + 38°, 502	9	26	10.50	+ 0.16	— 24.70	359	48	5.82	+ 2	14.78	—	0.2	2	25	45.96	0.00	50	56	41.6	+ 2.6
	9	Weisse (2) 603	9	27	43.17	+ 0.16	— 24.70	359	48	5.82	+ 2	42.53	—	0.2	2	27	18.63	0.00	50	57	9.4	+ 2.5
	10	Weisse (2) 644	9	29	13.90	+ 0.16	— 24.70	359	48	5.82	+ 2	2.96	—	0.2	2	28	49.36	— 0.01	50	56	29.8	+ 2.5
	11	Weisse (2) 1004	9	43	42.21	+ 0.01	— 24.69	8	48	5.28	+ 1	41.00	+ .	9.5	2	43	17.53	+ 0.01	59	56	17.0	— 0.6
	12	Weisse (2) 1031	9	44	48.62	+ 0.01	— 24.69	8	48	5.28	+ 2	39.24	+ .	9.5	2	44	23.94	0.00	59	57	15.2	— 0.7
	13	Weisse (2) 1047	9	45	49.71	+ 0.01	— 24.69	8	48	5.28	+ 1	39.77	+ .	9.3	2	45	25.03	0.00	59	56	15.5	— 0.7
	14	Weisse (2) 1255	9	54	41.18	+ 0.07	— 24.69	4	48	8.48	+ 6	56.88	+ .	5.2	2	54	16.56	— 0.08	56	1	31.8	+ 0.2
	15	Weisse (2) 1298	9	56	37.97	+ 0.07	— 24.69	4	48	8.48	+ 5	7.03	+ .	5.1	2	56	13.35	— 0.09	55	59	41.8	+ 0.2
	16	Weisse (2) 1312	9	57	20.46	+ 0.07	— 24.69	4	48	8.48	+ 4	31.00	+ .	5.1	2	56	55.84	— 0.10	55	59	5.8	+ 0.2
	17	48 (H) Cephei	8	6	32.84	+ 2.55	— 24.68	321	32	4.35	+ 2	54.10	—	47.5	3	6	10.71	. .	12	40	32.1	— 0.2
	18	ζ Arietis	9	8	52.60	— 0.11	— 24.62	18	12	3.65	+ 3	34.77	+ .	19.8	3	8	27.81	. .	69	22	19.4	— 1.2
	19	Weisse (2) 373	9	20	23.90	+ 0.07	— 24.68	4	50	5.72	+ 1	18.14	+ .	5.1	3	19	59.29	— 0.20	55	57	50.2	— 0.5
	20	D. M. + 33°, 657	9	21	44.72	+ 0.07	— 24.68	4	50	5.72	+ 4	48.60	+ .	5.2	3	21	20.11	— 0.21	56	1	20.7	— 0.5
	21	Weisse (2) 458	9	24	50.51	+ 0.07	— 24.67	4	50	5.72	+ 4	11.52	+ .	5.1	3	24	25.91	— 0.50	56	c	43.5	— 0.6
	22	ε Eridani	9	28	4.47	— 0.42	— 24.77	48	40	10.35	+ 2	49.23	+ 1	8.3	3	27	39.38	. .	99	50	29.1	— 0.1
	23	η Tauri	9	41	14.53	— 0.07	— 24.66	15	4	5.70	+ 3	50.81	+ .	16.3	3	40	49.79	. .	66	14	34.0	— 0.9
	24	Neptune	9	42	49.13	— 0.14	— 24.67	20	54	6.75	+ 3	37.14	+ .	23.0	3	42	24.32	. .	72	4	28.1	— 0.1
	25	ζ Persei	9	47	30.44	+ 0.03	— 24.64	7	18	6.75	+ 2	24.49	+ .	7.8	3	47	5.81	. .	58	27	0.2	— 1.3
	26	Lalande 7488	9	58	39.71	+ 0.13	— 24.66	1	24	. .	. .	. .	. .	. .	3	58	15.18	— 0.41	52	33	. .	. .
	27	Lalande 7603	9	1	16.17	+ 0.13	— 24.66	1	24	6.20	+ 3	34.74	+ .	1.5	4	0	51.64	— 0.42	52	34	3.6	— 0.8
	28	Lalande 7734	9	5	20.97	+ 0.13	— 24.66	1	24	6.20	+ 4	27.65	+ .	1.6	4	4	56.44	— 0.44	52	34	56.6	— 1.0
	29	ι Aurigæ	9	50	7.14	+ 0.06	— 24.66	5	50	6.48	+ 4	13.25	+ .	6.2	4	49	42.56	. .	57	0	47.1	0.0
	30	ε Ursæ Minoris, S.P.	9	57	50.79	— 5.38	— 24.63	301	4	4.48	+ 4	21.56	— 1	39.3	16	57	20.78	. .	352	13	7.9	— 0.7
	31	β Orionis	9	9	34.89	— 0.40	— 24.66	47	8	2.15	+ 4	37.15	+ 1	5.0	5	9	9.86	. .	98	20	5.5	— 0.4
	32	Weisse (2) 225	7	11	28.66	+ 0.19	— 24.63	357	54	. .	. .	. .	. .	. .	5	11	4.22	— 0.69	49	2	. .	. .
	33	Weisse (2) 248	9	12	3.81	+ 0.19	— 24.63	357	54	6.35	+ 4	8.93	—	2.1	5	11	39.37	— 0.69	49	4	34.4	— 2.6
	34	Weisse (2) 267	9	12	47.88	+ 0.19	— 24.63	357	54	6.35	+ 1	25.37	—	2.2	5	12	23.44	— 0.69	49	1	50.7	— 2.6
	35	D. M. + 40°, 1257	9	13	44.14	+ 0.19	— 24.63	357	54	6.35	+ 3	42.82	—	2.2	5	13	19.70	— 0.69	49	4	8.2	— 2.7
	36	β Tauri	6	19	37.85	— 0.01	— 24.57	10	20	7.00	+ 2	41.96	+ .	11.0	5	19	13.22	. .	61	29	21.2	— 1.0
S	37	δ Ophiuchi	9	8	51.77	— 0.32	— 24.46	42	14	5.75	+ 2	48.99	+ .	55.8	16	8	26.98	. .	93	24	11.7	— 1.7
	38	τ Herculis	9	16	44.56	+ 0.45	— 24.50	352	16	6.05	+ 2	55.19	—	8.3	16	16	20.54	. .	43	25	14.1	— 1.6
	39	α Scorpii	9	22	55.72	— 0.57	— 24.53	64	58	7.45	+ 4	4.39	+ 2	11.2	16	22	30.69	. .	116	10	44.2	— 2.2
	40	Venus I, S.	6	26	15.33	— 0.49	— 24.46	58	2	2.90	+ 3	36.30	+ 1	38.3	16	25	50.38	+ 0.25	109	13	38.7	. .
	41	Venus II	5	26	16.20	— 0.49	— 24.46	. .	. .	. .	. .	. .	. .	. .	16	25	51.25	— 0.62	. .	. .	. .	. .
	42	ζ Ophiuchi	9	31	22.62	— 0.39	— 24.44	49	8	3.52	+ 4	38.58	+ 1	11.0	16	30	57.77	. .	100	20	14.3	— 0.9
	43	η Herculis	9	39	25.63	+ 0.27	— 24.45	359	42	2.50	+ 3	30.01	—	0.3	16	39	1.44	. .	50	51	53.4	— 1.1
	44	κ Ophiuchi	9	52	44.86	— 0.18	— 24.40	29	16	5.65	+ 3	56.52	+ .	34.5	16	52	20.22	. .	80	26	57.9	— 0.3
II	45	Sun I, S.	9	30	0.09	— 0.52	— 24.43	60	54	0.88	+ 2	59.30	+ 1	50.2	19	29	35.14	+ 70.40	112	5	11.6	. .
	46	γ Cygni	9	18	34.74	+ 0.29	— 24.37	358	56	4.05	+ 3	37.32	—	1.1	20	18	10.61	. .	50	6	1.5	— 0.1
	47	ζ Cygni	9	8	32.73	+ 0.10	— 24.44	9	3	59.35	+ 3	20.60	+ .	9.9	21	8	8.42	. .	60	13	51.1	— 1.7
	48	α Cephei	9	16	15.58	+ 1.07	— 24.40	336	44	3.38	+ 3	12.86	—	26.4	21	15	52.25	. .	27	53	11.0	— 0.5
	49	ε Pegasi	9	39	4.02	— 0.18	— 24.41	29	28	0.95	+ 3	19.84	+ .	34.8	21	38	39.44	. .	80	38	16.8	— 1.5
	50	α Arietis	9	1	15.74	+ 0.13	— 24.56	15	54	2.92	+ 3	21.78	+ .	18.0	2	0	51.31	. .	67	4	3.9	— 1.3
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction		No.	Parallax		Semi- diameter		Corr. for Def. Illum.		Sum				
	in.	°	°						"			' "		' "		"		' "				
2	30.16	32.5	31.6	5, 6, 7, 10, 11, 12, 13, 15, } 16, 17, 19, 20, 21, 27. } One bisection. 33, 34, 35, 46. } 30. Three bisections.				1 to 3	+ 71.06		1	— 8.0		— 9.2		.		— 17.2				
8	29.98	37.8	37.4					5 to 36	+ 72.64		40	— 7.6		— 8.7		.		— 16.3				
28	30.01	35.8	34.7					37 to 49	+ 71.07		45	— 7.8		— 16		16.4		.		— 16 24.2		
36	30.03	35.2	34.9					50	+ 72.01													
37	30.20	30.	28.4																			
44	30.23	30.6	28.8																			
45	30.25	30.5	28.9																			
49	30.30	31.8	28.8																			
50	30.46	23.6	20.9																			

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD		CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
					Inst.	Clock	Instrument	Refraction							
January 11, S.	1	♄ Ceti	9	7 28.07	— 0.01	— 24.57	30 30 3.42	+ 3 48.17	+ 37.2	2 7 3.50	. . .	81 40 50.0	— 2.0		
	2	Weisse (2) 245	9	13 7.67	+ 0.35	— 24.56	359 32 6.00	+ 2 22.24	— 0.5	2 12 43.46	+ 0.08	50 40 48.9	+ 3.0		
	3	Weisse (2) 314	9	16 9.38	+ 0.35	— 24.56	359 32 6.00	+ 2 16.79	— 0.5	2 15 45.17	+ 0.07	50 40 43.5	+ 3.0		
	4	Weisse (2) 360	9	17 45.19	+ 0.35	— 24.56	359 32 6.00	+ 2 16.79	— 0.5	2 17 20.98	+ 0.06	50 40 43.5	+ 2.9		
	5	♄ Ceti	9	22 36.58	— 0.01	— 24.56	30 52 3.62	+ 3 36.16	+ 37.7	2 22 12.01	. . .	82 2 38.7	— 1.7		
	6	♄ Ceti	9	37 54.27	— 0.05	— 24.60	36 4 2.42	+ 3 10.30	+ 46.0	2 37 29.66	. . .	87 14 19.9	— 1.1		
	7	Weisse (2) 1255	7	54 40.92	+ 0.27	— 24.56	4 47 55.72	+ 7 10.56	+ 5.4	2 54 16.63	— 0.08	56 1 32.9	+ 0.3		
	8	Weisse (2) 1298	9	56 37.69	+ 0.27	— 24.56	4 47 55.72	+ 5 17.14	+ 5.4	2 56 13.40	— 0.09	55 59 40.5	+ 0.3		
	9	Weisse (2) 373	9	20 23.54	+ 0.27	— 24.55	4 50 0.70	+ 1 21.96	+ 5.4	3 19 59.26	— 0.20	55 57 49.3	— 0.4		
	10	D. M. + 33°, 657	9	21 44.44	+ 0.27	— 24.55	4 50 0.70	+ 4 51.86	+ 5.4	3 21 20.16	— 0.21	56 1 19.2	— 0.5		
	11	Weisse (2) 458	9	24 50.06	+ 0.27	— 24.55	4 50 0.70	+ 4 14.64	+ 5.4	3 24 25.78	— 0.22	56 0 41.9	— 0.6		
	12	♄ Tauri	9	41 14.16	+ 0.14	— 24.51	15 3 57.62	+ 3 56.39	+ 17.1	3 40 49.75	. . .	66 14 32.3	— 2.6		
	13	Lalande 7488	9	58 39.41	+ 0.32	— 24.55	1 24 2.78	+ 2 37.14	+ 1.6	3 58 15.18	— 0.41	52 33 2.7	— 0.7		
	14	Lalande 7603	9	1 15.86	+ 0.32	— 24.55	1 24 2.78	+ 3 35.79	+ 1.6	4 0 51.63	— 0.42	52 34 1.4	— 0.8		
	15	Lalande 7734	9	5 20.62	+ 0.32	— 24.55	1 24 . . .	. . .	. . .	4 4 56.39	— 0.43	52 35 . . .	. . .		
	16	Weisse (2) 225	9	11 28.40	+ 0.38	— 24.54	357 54 0.98	+ 1 13.13	— 2.3	5 11 4.24	— 0.69	49 1 33.0	— 2.5		
	17	Weisse (2) 248	9	12 3.66	+ 0.38	— 24.54	357 54 0.98	+ 4 13.28	— 2.3	5 11 39.50	— 0.69	49 4 33.2	— 2.5		
	18	Weisse (2) 267	9	12 47.61	+ 0.38	— 24.54	357 54 0.98	+ 1 30.10	— 2.3	5 12 23.45	— 0.70	49 1 50.0	— 2.5		
	19	Weisse (2) 342	9	15 23.20	+ 0.38	— 24.54	357 54 0.98	+ 4 36.52	— 2.2	5 14 59.04	— 0.70	49 4 56.5	— 2.6		
	20	♄ Orionis	9	26 42.32	— 0.08	— 24.63	39 12 5.65	+ 3 48.30	+ 51.9	5 26 17.71	. . .	90 23 7.1	— 1.1		
	21	♄ Orionis	9	49 31.62	— 0.02	— 24.55	31 26 0.62	+ 3 58.75	+ 39.0	5 49 7.07	. . .	82 36 59.6	— 1.8		
	22	♄ Ursæ Minoris, S. P.	7	8 45.00	— 11.21	— 24.53	305 27 59.60	+ 3 47.92	— 1 29.0	18 8 9.26	. . .	356 36 39.7	— 0.5		
	23	♄ Geminorum	7	31 39.59	+ 0.07	— 24.54	22 20 . . .	. . .	. . .	6 31 15.14	. . .	73 30 . . .	. . .		
	24	♄ Canis Majoris	9	40 38.41	— 0.20	— 24.55	55 22 3.30	+ 4 0.00	+ 1 32.3	6 40 13.69	. . .	106 33 56.8	— 0.9		
	25	Yarnall 2790	6	49 28.07	— 0.26	— 24.52	63 2 2.55	+ 4 32.04	+ 2 5.2	6 49 3.29	— 0.98	114 15 1.0	— 9.2		
	26	Anonymous	5	49 28.12	— 0.26	— 24.52	63 2 2.55	+ 4 8.35	+ 2 5.1	6 49 3.34	— 0.98	114 14 37.2	— 9.2		
	27	Σ (P. M.) 825	6	5 42.65	— 0.13	— 24.52	16 22 1.78	+ 3 32.01	+ 18.8	7 5 18.26	— 0.64	67 32 13.8	— 7.3		
	28	Σ 1035 minor	5	5 43.12	+ 0.13	— 24.52	16 22 1.78	+ 3 25.17	+ 18.8	7 5 18.73	— 0.64	67 32 7.0	— 7.3		
	29	♄ Geminorum	9	27 52.03	+ 0.24	— 24.36	6 42 4.85	+ 3 32.51	+ 7.6	7 27 27.75	. . .	57 52 6.2	— 0.8		
W.	30	♄ Scorpii	9	22 55.54	— 0.44	— 24.45	64 58 . . .	. . .	. . .	16 22 30.71	. . .	116 11 . . .	. . .		
	31	♄ Herculis	9	25 46.90	+ 0.11	— 24.35	17 5 58.08	+ 3 17.92	+ 19.8	16 25 22.62	. . .	68 15 57.0	— 0.3		
	32	Venus II, N.	9	31 9.67	— 0.36	— 24.39	58 13 56.08	+ 4 18.44	+ 1 43.6	16 30 44.92	— 0.61	109 26 19.3	. . .		
	33	Venus S.	. . .	. . .	. . .	. . .	58 13 56.08	+ 4 36.73	+ 1 43.7	. . .	. . .	109 26 37.7	. . .		
	34	♄ Herculis	9	39 25.53	+ 0.40	— 24.45	359 41 59.92	+ 3 33.33	— 0.3	16 39 1.54	. . .	50 51 54.1	— 0.7		
	35	♄ Ophiuchi	9	52 44.66	— 0.05	— 24.31	29 15 52.62	+ 4 8.07	+ 36.0	16 52 20.22	. . .	80 26 57.9	— 0.5		
	36	♄ Ursæ Minoris	4	57 39.46	+ 5.55	— 24.39	316 37 56.60	+ 3 34.77	— 1 0.3	16 57 20.62	. . .	7 46 52.3	+ 0.4		
12	37	Sun I, S.	9	34 20.23	— 0.39	— 24.40	60 43 57.18	+ 3 23.52	+ 1 52.3	19 33 55.44	+ 70.20	111 55 34.2	. . .		
	38	Sun II, N.	9	36 40.63	— 0.39	— 24.40	60 12 4.85	+ 2 42.81	+ 1 49.9	19 36 15.84	— 70.20	111 22 58.8	. . .		
	39	♄ Cygni	9	37 58.76	+ 0.54	— 24.41	353 57 59.10	+ 2 51.99	— 6.6	20 37 34.89	. . .	45 7 5.7	— 0.4		
13, S.	40	♄ Ophiuchi	9	31 21.94	— 0.45	— 23.62	49 8 4.62	+ 4 36.82	+ 1 11.6	16 30 57.94	. . .	100 20 14.2	— 1.4		
	41	♄ Herculis	8	39 24.86	+ 0.22	— 23.55	359 42 . . .	. . .	. . .	16 39 1.53	. . .	50 52 . . .	. . .		
	42	Venus I, S.	5	40 58.78	— 0.56	— 23.55	58 40 1.78	+ 3 2.53	+ 1 41.4	16 40 34.67	+ 0.26	109 51 6.9	. . .		
	43	Venus II	6	40 59.68	— 0.56	— 23.55	58 40 . . .	. . .	. . .	16 40 35.57	— 0.64	109 51 . . .	. . .		
	44	♄ Ophiuchi	9	52 44.11	— 0.23	— 23.53	29 16 1.98	+ 4 0.44	+ 34.6	16 52 20.32	. . .	80 26 58.2	— 0.6		
	45	♄ Herculis	9	9 54.40	— 0.17	— 23.53	24 18 1.95	+ 3 59.10	+ 27.9	17 9 30.67	. . .	75 28 50.1	— 2.0		
	46	♄ Draconis	9	28 14.83	+ 0.56	— 23.57	346 26 1.48	+ 4 48.84	— 14.7	17 27 51.82	. . .	37 36 56.8	— 2.3		
	47	♄ Ophiuchi	9	30 6.11	— 0.19	— 23.58	26 10 2.15	+ 4 30.50	+ 30.3	17 29 42.35	. . .	77 21 24.1	— 2.8		
	48	♄ Ursæ Minoris	3	8 19.77	+ 12.32	— 23.58	312 14 . . .	. . .	. . .	18 8 8.51	. . .	3 23 . . .	. . .		
	49	♄ Lyrae	9	33 30.12	+ 0.20	— 23.56	0 10 0.55	+ 2 49.18	+ 0.2	18 33 6.73	. . .	51 19 11.1	— 1.8		
	50	51 (H) Cephei, S. P.	9	48 43.59	— 16.02	— 23.59	306 4 . . .	. . .	. . .	6 48 3.98	. . .	357 13 . . .	. . .		
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3		Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum			
	in.	°	°				°		°	°	°	°			
11	30.49	21.2	18.8	2, 3, 4, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 25, 26. } One bisection.		1 to 29	+ 72.01	32	— 7.6	+ 9.3	— 0.2	+ 1.5			
21	30.55	19.5	16.9			31 to 39	+ 72.33	33	— 7.6	— 9.3	. . .	— 16.9			
29	30.57	18.2	15.9			40 to 50	+ 71.61	37	— 7.8	— 16 17.7	. . .	— 16 25.5			
34	30.74	18.5	16.4			38	— 7.8	+ 16 17.7	. . .	+ 16 9.9					
38	30.70	25.0	23.7			42	— 7.5	— 8.5	. . .	— 16.0					
39	30.68	26.4	25.8												
43	30.45	30.5	29.2												

[illegible]

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction						
						Inst.	Clock		Instrument	Refraction										
January 19, W.	1	Weisse (2) 1312	.	9	m. s. 57 19.08	+	0.19	-	23.42	° / ' 4 48 2.10	+	4 35.91	+	5.3	h. m. s. 2 56 55.85	+	0.05	55 59 4.5	+	0.4
	2	Weisse (2) 373	.	9	20 22.41	+	0.19	-	23.42	4 50 4.98	+	1 18.36	+	5.3	3 19 59.18	-	0.07	55 57 49.8	-	0.2
	3	D. M. + 33°, 657	10.5	7	21 43.43	+	0.19	-	23.42	4 50 4.98	+	4 47.51	+	5.4	3 21 20.20	-	0.08	56 1 19.1	-	0.2
	4	Weisse (2) 458	.	9	24 49.00	+	0.19	-	23.42	4 50 4.98	+	4 12.25	+	5.3	3 24 25.77	-	0.09	56 0 43.7	-	0.3
	5	Neptune	.	9	42 20.16	-	0.08	-	23.42	20 54 0.80	+	4 40.96	+	23.9	3 41 56.66	.	.	72 5 26.9	-	0.1
	6	Lalande 7488	.	9	58 38.33	+	0.26	-	23.42	1 24 0.72	+	2 38.62	+	1.6	3 58 15.17	-	0.29	52 33 2.1	-	0.2
	7	Lalande 7603	.	9	1 14.77	+	0.26	-	23.42	1 24 0.72	+	3 38.25	+	1.6	4 0 51.61	-	0.31	52 34 1.8	-	0.2
	8	Lalande 7734	.	9	5 19.58	+	0.26	-	23.42	1 24 0.72	+	4 31.19	+	1.6	4 4 56.42	-	0.32	52 34 54.7	-	0.3
	9	Weisse (2) 225	.	8	11 27.34	+	0.34	-	23.43	357 53 57.05	+	1 16.91	-	2.3	5 11 4.25	-	0.63	49 1 32.9	-	1.5
	10	Weisse (2) 248	11.	3	12 2.54	+	0.34	-	23.43	357 53 57.05	+	4 16.66	-	2.2	5 11 39.45	-	0.63	49 4 32.7	-	1.5
	11	Weisse (2) 342	.	9	15 22.17	+	0.34	-	23.43	357 53 57.05	+	4 41.49	-	2.2	5 14 59.08	-	0.64	49 4 57.5	-	1.6
	12	51 (H) Cephei	.	4	48 12.10	+	16.98	-	23.44	311 38 0.25	+	3 34.30	-	1 10.3	6 48 5.64	.	.	2 46 45.5	-	1.8
	13	Yarnall 2790	.	6	49 27.38	-	0.58	-	23.44	63 2 5.55	+	4 32.57	+	2 3.1	6 49 3.36	-	0.97	114 15 2.4	-	11.0
	14	Anonymous	10.	5	49 27.46	-	0.58	-	23.44	67 2 5.55	+	4 8.31	+	2 3.1	6 49 3.44	-	0.97	114 14 38.2	-	11.0
	15	ε Canis Majoris	.	8	54 38.72	-	0.63	-	23.53	67 36 4.40	+	4 25.22	+	2 31.7	6 54 14.65	.	.	118 49 22.5	-	1.6
	16	Σ (P. M.) 825	.	6	5 41.73	-	0.01	-	23.44	16 22 4.48	+	3 31.47	+	18.5	7 5 18.28	-	0.68	67 32 15.7	-	7.1
	17	Σ 1035 minor	.	5	5 42.16	-	0.01	-	23.44	16 22 4.48	+	3 24.37	+	18.5	7 5 18.71	-	0.68	67 32 8.5	-	7.1
	18	δ Geminorum	.	9	13 50.10	-	0.01	-	23.37	16 38 0.92	+	4 9.17	+	18.8	7 13 26.65	.	.	67 48 50.1	-	1.4
	19	α² Geminorum	.	9	27 51.34	+	0.15	-	23.50	6 42 1.48	+	3 36.13	+	7.4	7 27 28.04	.	.	57 52 6.2	-	0.3
	20	β Geminorum	.	9	38 51.74	+	0.08	-	23.38	10 32 4.62	+	3 42.37	+	11.7	7 38 28.37	.	.	61 42 19.9	-	1.9
	21	D. M. + 24°, 1784	9.5	5	44 5.15	+	0.02	-	23.45	14 43 57.62	+	7 32.54	+	16.6	7 43 41.72	-	0.69	65 58 8.0	-	6.3
	22	Anonymous	10.	5	44 8.98	+	0.02	-	23.45	14 43 57.62	+	7 27.25	+	16.6	7 43 45.55	-	0.69	65 58 2.7	-	6.3
	23	Anonymous	.	9	44 16.17	+	0.02	-	23.45	14 43 57.62	+	8 30.89	+	16.7	7 43 52.74	-	0.69	65 59 6.4	-	6.3
	24	Lalande (F) 1186	.	2	47 10.14	+	2.54	-	23.45	324 38 1.52	+	3 30.05	-	44.4	7 46 49.23	-	2.86	15 47 8.4	-	4.6
S.	25	α¹ Herculis	.	8	9 54.00	-	0.14	-	23.01	24 17 58.08	+	4 3.66	+	28.3	17 9 30.79	.	.	75 28 51.2	-	2.3
	26	Venus I, S.	.	6	10 57.42	-	0.60	-	23.07	59 39 57.98	+	4 40.92	+	1 46.6	17 10 33.75	+	0.27	110 52 46.7	.	.
	27	Venus II	.	5	10 58.30	-	0.60	-	23.07	59 40 . .	.	.	.	17 10 34.63	-	0.61	.	.	.	
	28	β Draconis	.	9	28 14.41	+	0.73	-	23.08	346 26 7.15	+	4 45.16	-	14.9	17 27 52.06	.	.	37 36 58.6	-	2.5
	29	α Ophiuchi	.	9	30 5.79	-	0.16	-	23.15	26 10 1.78	+	4 31.79	+	30.7	17 29 42.55	.	.	77 21 25.5	-	2.7
	30	μ Herculis	.	9	42 25.81	+	0.07	-	23.08	11 2 3.00	+	4 12.89	+	12.2	17 42 2.79	.	.	62 12 49.3	-	1.2
20	31	Moon I, S.	.	9	49 54.72	-	0.27	-	23.25	33 44 2.62	+	2 19.95	+	40.8	1 49 31.20	+	61.43	84 53 24.6	.	.
	32	α Arietis	.	9	1 14.34	+	0.08	-	23.25	15 54 1.02	+	3 25.33	+	17.5	2 0 51.17	.	.	67 4 5.1	-	0.6
	33	ξ¹ Ceti	.	9	7 26.86	-	0.22	-	23.27	30 30 1.65	+	3 51.73	+	36.0	2 7 3.39	.	.	81 40 50.6	-	1.9
	34	Weisse (2) 1255	.	9	54 39.59	+	0.20	-	23.27	4 48 1.60	+	7 3.96	+	5.3	2 54 16.52	+	0.08	56 1 32.1	+	0.4
	35	Weisse (2) 1298	.	9	56 36.32	+	0.20	-	23.27	4 48 1.60	+	5 12.31	+	5.2	2 56 13.25	+	0.07	55 59 40.3	+	0.3
	36	Weisse (2) 1312	.	9	57 18.82	+	0.20	-	23.27	4 48 1.60	+	4 36.42	+	5.2	2 56 55.75	+	0.07	55 59 4.4	+	0.3
P.	37	ζ Arietis	.	9	8 51.04	-	0.04	-	23.25	18 12 5.92	+	3 30.79	+	20.2	3 8 27.73	.	.	69 22 18.1	-	2.7
	38	α Persei	.	9	16 42.67	+	0.62	-	23.30	349 22 4.45	+	3 58.03	-	11.4	3 16 20.01	.	.	40 32 12.3	-	1.2
	39	ε Eridani	.	9	28 2.89	-	0.46	-	23.27	48 40 6.25	+	2 52.02	+	1 9.6	3 27 39.15	.	.	99 50 29.1	-	1.1
	40	Neptune	.	9	42 17.53	-	0.09	-	23.29	20 56 6.12	+	2 41.53	+	23.5	3 41 54.15	.	.	72 5 32.3	-	0.1
	41	α Ophiuchi	.	9	30 5.93	-	0.25	-	23.18	26 10 . .	.	.	.	17 29 42.51	.	.	77 21 . .	.	.	
	42	α Lyrae	.	9	33 29.77	+	0.29	-	23.18	0 10 0.35	+	2 52.46	+	0.2	18 33 6.89	.	.	51 19 14.2	-	0.8
21	43	ζ Aquilæ	.	9	0 37.30	-	0.23	-	23.14	25 8 3.65	+	3 14.11	+	29.4	19 0 13.91	.	.	76 18 8.4	-	0.7
	44	Sun I, S.	.	9	12 50.78	-	0.74	-	23.15	58 58 12.42	+	4 33.32	+	1 43.9	20 12 26.89	+	69.41	110 10 50.8	.	.
	45	Sun II, N.	.	9	15 9.59	-	0.74	-	23.15	58 26 4.00	+	4 14.56	+	1 41.8	20 14 45.70	-	69.40	109 38 21.6	.	.
	46	α Aquarii	.	4	0 23.86	-	0.46	-	23.24	39 42 . .	.	.	.	22 0 0.26	.	.	90 52 . .	.	.	
	47	ζ Pegasi	.	9	36 14.40	-	0.29	-	23.05	28 36 . .	.	.	.	22 35 50.97	.	.	79 45 . .	.	.	
	48	α Pegasi	.	9	59 32.86	-	0.22	-	23.13	24 13 58.68	+	3 3.50	+	28.2	22 59 9.50	.	.	75 23 51.6	-	1.0
	49	ξ¹ Ceti	.	9	7 26.69	-	0.13	-	23.20	30 30 . .	.	.	.	2 7 3.37	.	.	81 41 . .	.	.	
	50	Weisse (2) 245	.	9	13 6.14	+	0.33	-	23.19	359 32 7.48	+	2 19.59	-	0.5	2 12 43.28	+	0.30	50 40 47.8	+	2.8
	51	Weisse (2) 314	.	9	16 7.80	+	0.33	-	23.19	359 32 7.48	+	2 15.50	-	0.5	2 15 44.94	+	0.28	50 40 43.7	+	2.8
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum						
11	in.	°	°	2, 3, 6, 9, 10, 18, 21, 22, 23, 34, 35, 36. } One bisection. 31. Three bisections.				1 to 8	+	72.62	26	-	7.3	-	8.2	.	-	15.5		
24	30.09	20.0	17.4					9 to 24	+	73.87	31	-	29 57.6	-	14 48.2	.	-	44 45.8		
26	30.05	18.2	15.8					25 to 30	+	72.41	44	-	7.7	-	16 14.6	.	-	16 22.3		
30	30.03	19.5	18.1					31 to 40	+	72.86	45	-	7.6	+	16 14.6	.	+	16 7.0		
31	30.01	26.5	27.6					42 to 51	+	72.93										
31	30.08	30.	29.2																	
40	30.11	28.	27.0																	
42	30.32	23.5	20.6																	
43	30.32	23.0	21.1																	
45	30.31	22.5	21.3																	
48	30.33	23.0	21.4																	
				30.	Read at 20 ^h 0 ^m .															
				40.	Read at 5 ^h 8 ^m .															

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD		CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES			CORRECTIONS		APPARENT RIGHT ASCENSION			Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE			Miscellaneous Correction			
							Inst.	Clock																
January 21, P.					m.	s.	s.	s.	°	'	''	'	''	'	''	h.	m.	s.	s.	°	'	''	'	''
	1	Weisse (2) 360 .	.	9	17	43.67	+ 0.33	— 23.19	359	32	7.48	+ 2	14.68	—	0.5	2	17	20.81	+ 0.27	50	40	42.9	+ 2.7	
	2	Bonn VI + 38°, 502	.	9	26	8.51	+ 0.32	— 23.18	359	48	4.65	+ 2	14.48	—	0.2	2	25	45.65	+ 0.22	50	56	40.1	+ 2.5	
	3	Weisse (2) 603 .	.	9	27	41.08	+ 0.32	— 23.18	359	48	4.65	+ 2	42.87	—	0.2	2	27	18.22	+ 0.21	50	57	8.5	+ 2.5	
	4	Weisse (2) 644 .	.	9	29	11.90	+ 0.32	— 23.18	359	48	4.65	+ 2	3.16	—	0.2	2	28	49.04	+ 0.20	50	56	28.8	+ 2.4	
	5	Moon I, S.	.	9	36	26.20	— 0.12	— 23.18	29	42	2.55	+ 4	24.31	+	36.2	2	36	2.90	+ 62.15	80	53	24.3	.	.
	6	Weisse (2) 1004	.	9	43	40.47	+ 0.16	— 23.18	8	48	0.12	+ 1	46.28	+	9.8	2	43	17.45	+ 0.19	59	56	17.4	— 0.8	
	7	Weisse (2) 1031	.	9	44	46.89	+ 0.16	— 23.18	8	48	0.12	+ 2	42.65	+	9.9	2	44	23.87	+ 0.18	59	57	13.9	— 0.8	
	8	Weisse (2) 1047	.	9	45	47.93	+ 0.16	— 23.18	8	48	0.12	+ 1	43.88	+	9.8	2	45	24.91	+ 0.18	59	56	15.0	— 0.8	
	9	Weisse (2) 1255	.	9	54	39.31	+ 0.22	— 23.18	4	47	59.85	+ 7	4.27	+	5.4	2	54	16.35	+ 0.10	56	1	30.7	+ 0.3	
	10	Weisse (2) 1298	.	9	56	36.09	+ 0.22	— 23.18	4	47	59.85	+ 5	14.25	+	5.4	2	56	13.13	+ 0.09	55	59	40.7	+ 0.3	
	11	Weisse (2) 1312	.	9	57	18.60	+ 0.22	— 23.18	4	47	59.85	+ 4	38.32	+	5.4	2	56	55.64	+ 0.09	55	59	4.8	+ 0.3	
	12	ζ Arietis	.	9	8	50.84	+ 0.02	— 23.12	18	11	59.15	+ 3	37.55	+	20.9	3	8	27.68	.	69	22	18.8	— 2.0	
	13	Weisse (2) 373 .	.	9	20	22.01	+ 0.23	— 23.18	4	49	57.62	+ 1	24.54	+	5.4	3	19	59.06	— 0.04	55	57	48.8	— 0.2	
	14	D. M. + 33°, 657	.	9	21	42.98	+ 0.23	— 23.18	4	49	57.62	+ 4	55.04	+	5.5	3	21	20.03	— 0.04	56	1	19.4	— 0.2	
	15	Weisse (2) 458 .	.	9	24	48.62	+ 0.23	— 23.17	4	49	57.62	+ 4	18.03	+	5.4	3	24	25.68	— 0.06	56	0	42.2	— 0.3	
	16	ε Eridani	.	9	28	2.69	— 0.32	— 23.22	48	40	3.88	+ 2	51.58	+	12.2	3	27	39.20	.	99	50	28.9	— 1.4	
	17	Neptune	.	9	42	14.99	— 0.02	— 23.17	20	53	57.22	+ 4	53.18	+	24.3	3	41	51.80	.	72	5	35.9	— 0.1	
	18	Lalande 7488 .	.	9	58	37.88	+ 0.29	— 23.17	1	24	0.42	+ 2	39.70	+	1.6	3	58	15.00	— 0.26	52	33	2.9	— 0.1	
	19	Lalande 7602 .	.	9	1	14.33	+ 0.29	— 23.17	1	24	0.42	+ 3	38.10	+	1.6	4	0	51.45	— 0.27	52	34	1.3	— 0.2	
	20	Lalande 7734 .	.	9	5	18.99	+ 0.29	— 23.17	1	24	0.42	+ 4	30.71	+	1.6	4	4	56.11	— 0.29	52	34	53.9	— 0.3	
	21	Weisse (2) 225 .	.	9	11	26.98	+ 0.37	— 23.16	357	54	0.60	+ 1	12.68	—	2.3	5	11	4.19	— 0.60	49	1	32.2	— 1.4	
	22	Weisse (2) 248 .	.	9	12	2.13	+ 0.36	— 23.16	357	54	0.60	+ 4	11.96	—	2.3	5	11	39.33	— 0.60	49	4	31.5	— 1.4	
	23	Weisse (2) 342 .	.	9	15	21.71	+ 0.36	— 23.16	357	54	0.60	+ 4	35.32	—	2.3	5	14	58.91	— 0.61	49	4	54.8	— 1.5	
	24	δ Orionis	.	9	26	41.00	— 0.23	— 23.20	39	11	58.90	+ 3	54.88	+	52.0	5	26	17.61	.	90	23	7.0	— 2.2	
	25	ε Orionis	.	9	30	55.72	— 0.23	— 23.18	40	6	6.50	+ 3	14.49	+	53.7	5	30	32.34	.	91	16	35.9	— 2.4	
	26	ν Orionis	.	9	1	34.40	— 0.06	— 23.08	24	2	4.98	+ 4	19.90	+	28.5	6	1	11.19	.	75	13	14.6	— 1.8	
	27	δ Ursæ Minoris, S. P.	.	7	8	47.61	— 14.00	— 23.15	305	27	59.82	+ 3	45.18	—	29.2	18	8	10.46	.	356	36	37.0	+ 0.2	
23, P.	28	β Lyræ	.	9	46	16.64	+ 0.09	— 21.85	5	36	5.18	+ 3	28.77	+	6.1	18	45	54.92	.	56	46	1.3	— 2.4	
24	29	ζ Aquilæ	.	9	0	36.01	— 0.26	— 21.77	25	8	2.90	+ 3	14.29	+	28.8	19	0	13.94	.	76	18	7.2	— 2.5	
	30	Sun I, S.	.	9	25	26.50	— 0.72	— 21.80	58	16	20.78	+ 4	42.24	+	39.1	20	25	3.98	+ 69.04	109	29	3.3	.	
	31	Sun II, N.	.	9	27	44.59	— 0.72	— 21.80	57	44	4.35	+ 4	34.80	+	37.0	20	27	22.07	— 69.05	108	56	37.4	.	
	32	α Aquarii	.	9	0	22.38	— 0.46	— 21.76	39	42	7.05	+ 2	32.18	+	50.9	22	0	0.14	.	90	51	51.3	— 2.6	
	33	ζ Pegasi	.	9	36	13.09	— 0.31	— 21.73	28	36	5.82	+ 2	12.87	+	33.4	22	35	51.00	.	79	45	13.3	— 1.4	
	34	α Piscis Australis .	.	9	51	48.39	— 0.89	— 21.84	69	0	5.45	+ 4	0.39	+	39.0	22	51	25.73	.	120	13	6.0	— 2.4	
	35	ξ ¹ Ceti	.	9	7	25.38	— 0.23	— 21.83	30	30	5.85	+ 3	47.67	+	36.6	2	7	3.32	.	81	40	51.3	— 1.4	
	36	Weisse (2) 245 .	.	9	13	4.83	+ 0.28	— 21.83	359	32	6.22	+ 2	23.31	—	0.5	2	12	43.28	+ 0.34	50	40	50.2	+ 2.7	
	37	Weisse (2) 314 .	.	9	16	6.48	+ 0.28	— 21.83	359	32	6.22	+ 2	19.11	—	0.5	2	15	44.93	+ 0.32	50	40	46.0	+ 2.6	
	38	Weisse (2) 360 .	.	9	17	42.38	+ 0.28	— 21.83	359	32	6.22	+ 2	18.03	—	0.5	2	17	20.83	+ 0.31	50	40	44.9	+ 2.6	
	39	ξ ² Ceti	.	9	22	33.87	— 0.23	— 21.80	30	52	.	.	.	.	.	2	22	11.82	.	82	3	.	.	
	40	Bonn VI + 38°, 502	.	9	26	7.19	+ 0.27	— 21.82	359	48	4.35	+ 2	16.49	—	0.2	2	25	45.64	+ 0.27	50	56	41.8	+ 2.4	
		41	Weisse (2) 603 .	.	9	27	39.80	+ 0.27	— 21.82	359	48	4.35	+ 2	44.24	—	0.2	2	27	18.25	+ 0.26	50	57	9.6	+ 2.4
	42	Weisse (2) 644 .	.	9	29	10.52	+ 0.27	— 21.82	359	48	4.35	+ 2	4.91	—	0.2	2	28	48.97	+ 0.25	50	56	30.3	+ 2.3	
	43	γ ² Ceti	.	9	37	51.59	— 0.30	— 21.84	36	4	6.85	+ 3	8.09	+	45.3	2	37	29.48	.	87	14	21.4	— 0.9	
	44	Weisse (2) 1004	.	9	43	39.06	+ 0.09	— 21.81	8	48	5.55	+ 1	42.02	+	9.6	2	43	17.34	+ 0.23	59	56	18.4	— 0.9	
	45	Weisse (2) 1031	.	9	44	45.47	+ 0.09	— 21.81	8	48	5.55	+ 2	38.63	+	9.7	2	44	23.75	+ 0.22	59	57	15.1	— 0.9	
	46	Weisse (2) 1047	.	9	45	46.51	+ 0.09	— 21.81	8	48	5.55	+ 1	38.56	+	9.6	2	45	24.79	+ 0.22	59	56	14.9	— 0.9	
	47	Weisse (2) 1255	.	9	54	37.97	+ 0.16	— 21.80	4	48	3.32	+ 7	2.56	+	5.3	2	54	16.33	+ 0.14	56	1	32.4	+ 0.2	
	48	Weisse (2) 1298	.	9	56	34.74	+ 0.16	— 21.80	4	48	3.32	+ 5	11.90	+	5.3	2	56	13.10	+ 0.13	55	59	41.7	+ 0.2	
	49	Weisse (2) 1312	.	8	57	17.31	+ 0.16	— 21.80	4	48	3.32	+ 4	35.32	+	5.3	2	56	55.67	+ 0.13	55	59	5.1	+ 0.2	
	50	Weisse (2) 373 .	.	9	20	20.71	+ 0.16	— 21.78	4	50	6.18	+ 1	17.45	+	5.3	3	19	59.09	0.00	55	57	50.1	— 0.2	

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3	Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°			''		'			

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
January 24, P.					m. s.	s.	s.	° / //	/ //	/ //	h. m. s.	s.	° / //	//
	1	D. M. + 33°, 657	.	9	21 41.54	+ 0.16	- 21.78	4 50 6.18	+ 4 48.23	+ 5.3	3 21 19.92	0.00	56 1 20.9	- 0.3
	2	Weisse (2) 458	.	9	24 47.27	+ 0.16	- 21.78	4 50 6.18	+ 4 10.65	+ 5.3	3 24 25.65	- 0.02	56 0 43.3	- 0.3
	3	Neptune	.	9	42 7.62	- 0.10	- 21.76	20 54 3.68	+ 4 58.53	+ 23.9	3 41 45.76	.	72 5 47.3	- 0.1
	4	Lalande 7488	.	9	58 36.61	+ 0.24	- 21.75	1 24 4.50	+ 2 36.29	+ 1.6	3 58 15.10	- 0.22	52 33 3.6	0.0
	5	Lalande 7603	.	9	1 13.02	+ 0.24	- 21.75	1 24 4.50	+ 3 35.20	+ 1.6	4 0 51.51	- 0.24	52 34 2.5	- 0.1
	6	Lalande 7734	.	9	5 17.64	+ 0.24	- 21.75	1 24 4.50	+ 4 28.60	+ 1.6	4 4 56.13	- 0.26	52 34 55.9	- 0.2
	7	α Tauri	.	9	29 51.74	- 0.12	- 21.75	22 32 3.10	+ 4 15.07	+ 26.0	4 29 29.89	.	73 43 5.4	- 1.5
	8	ι Aurigæ	.	9	50 4.00	+ 0.14	- 21.71	5 50 6.85	+ 4 9.52	+ 6.5	4 49 42.43	.	57 0 44.1	- 2.2
	9	ϵ Ursæ Minoris, S. P.	.	8	57 50.34	- 6.72	- 21.71	301 4 0.78	+ 4 25.98	- 1 43.0	16 57 21.91	.	352 13 5.0	+ 0.4
	10	Moon I	.	9	7 3.40	- 0.09	- 21.70	20 25 . .	.	.	5 6 41.61	+ 66.48	71 17 . .	.
	11	Weisse (2) 225	.	9	11 25.60	+ 0.32	- 21.70	357 54 4.78	+ 1 8.23	- 2.3	5 11 4.22	- 0.58	49 1 31.9	- 1.1
	12	Weisse (2) 248	.	9	12 0.80	+ 0.32	- 21.70	357 54 4.78	+ 4 8.23	- 2.2	5 11 39.42	- 0.58	49 4 32.0	- 1.2
	13	Weisse (2) 342	.	9	15 20.34	+ 0.32	- 21.69	357 54 4.78	+ 4 31.91	- 2.2	5 14 58.97	- 0.59	49 4 55.7	- 1.3
	14	β Tauri	.	9	19 34.81	+ 0.06	- 21.67	10 20 4.22	+ 2 42.75	+ 11.4	5 19 13.18	.	61 29 19.6	- 1.9
27, P.	15	λ Ursæ Minoris, S. P.	.	4	36 1.42	- 48.84	- 20.77	307 48 . .	.	.	19 34 51.81	.	358 58 . .	.
	16	ϕ Geminorum . .	.	9	47 0.00	+ 0.08	- 20.76	11 45 57.30	+ 4 16.23	+ 13.2	7 46 39.31	.	62 56 47.9	- 1.2
	17	Moon I, N. . . .	.	9	58 35.41	- 0.05	- 20.77	19 22 0.40	+ 3 10.41	+ 22.2	7 58 14.59	+ 69.59	70 31 54.2	.
	18	γ Argus	.	9	3 8.94	- 0.56	- 20.82	62 46 2.72	+ 4 34.15	+ 2 2.2	8 2 47.61	.	113 59 0.3	- 3.4
	19	η Cancræ	.	8	26 35.43	- 0.02	- 20.73	18 0 . .	.	.	8 26 14.64	.	69 11 . .	.
W.	20	μ Herculis	.	9	42 23.61	+ 0.10	- 20.72	11 2 4.65	+ 4 12.66	+ 12.4	17 42 3.04	.	62 12 50.9	- 1.7
	21	Venus II	.	9	51 45.89	- 0.48	- 20.67	60 32 . .	.	.	17 51 24.74	- 0.56	111 44 . .	.
	22	ζ Aquilæ	.	9	0 34.79	- 0.10	- 20.64	25 7 54.98	+ 3 23.36	+ 29.6	19 0 14.03	.	76 18 9.1	- 1.5
	23	γ Aquilæ	.	9	41 15.10	- 0.14	- 20.61	28 28 2.62	+ 4 36.17	+ 34.1	19 40 54.30	.	79 39 34.1	- 0.5
	24	α Aquilæ	.	9	45 38.21	- 0.16	- 20.68	30 15 58.82	+ 2 41.14	+ 36.7	19 45 17.39	.	81 25 37.9	- 0.7
28	25	Sun I, S. . . .	.	9	42 3.20	- 0.45	- 20.65	57 16 0.45	+ 4 33.55	+ 1 37.3	20 41 42.10	+ 68.58	108 28 32.5	.
	26	Sun II, N. . . .	.	9	44 20.36	- 0.45	- 20.65	56 43 58.15	+ 4 7.11	+ 1 35.3	20 43 59.26	- 68.58	107 56 1.8	.
	27	Mercury C. . . .	.	9	13 41.68	- 0.44	- 20.65	56 55 56.05	+ 3 2.91	+ 1 35.9	21 13 20.59	0.00	108 6 56.1	.
	28	α Piscis Australis	.	7	51 46.92	- 0.58	- 20.70	69 0 . .	.	.	22 51 25.70	.	120 13 . .	.
	29	α Pegasi	.	9	59 30.13	- 0.09	- 20.57	24 13 50.40	+ 3 13.18	+ 28.1	22 59 9.41	.	75 23 52.9	- 0.6
	30	Weisse (2) 245	.	9	13 3.44	+ 0.34	- 20.57	359 31 55.12	+ 2 32.81	- 0.5	2 12 43.21	+ 0.41	50 40 48.6	+ 2.6
	31	Weisse (2) 314	.	9	16 5.13	+ 0.34	- 20.57	359 31 55.12	+ 2 28.27	- 0.5	2 15 44.90	+ 0.39	50 40 44.1	+ 2.6
	32	Weisse (2) 360	.	9	17 41.08	+ 0.34	- 20.57	359 31 55.12	+ 2 28.46	- 0.5	2 17 20.85	+ 0.27	50 40 44.3	+ 2.6
	33	Bonn VI + 38°, 502	.	9	26 5.83	+ 0.34	- 20.57	359 47 57.18	+ 2 23.56	- 0.2	2 25 45.60	+ 0.34	50 56 41.7	+ 2.4
	34	Weisse (2) 603	.	9	27 38.44	+ 0.34	- 20.57	359 47 57.18	+ 2 50.54	- 0.2	2 27 18.21	+ 0.32	50 57 8.7	+ 2.3
	35	Weisse (2) 644	.	9	29 9.30	+ 0.34	- 20.57	359 47 57.18	+ 2 11.62	- 0.2	2 28 49.07	+ 0.32	50 56 29.8	+ 2.3
	36	γ^2 Ceti	.	9	37 50.20	- 0.20	- 20.61	36 3 53.70	+ 3 19.93	+ 45.6	2 37 29.43	.	87 14 20.4	- 2.2
	37	Weisse (2) 1004	.	9	43 37.71	+ 0.16	- 20.56	8 48 7.38	+ 1 37.71	+ 9.7	2 43 17.31	+ 0.28	59 56 16.0	- 0.9
	38	Weisse (2) 1031	.	9	44 44.20	+ 0.16	- 20.56	8 48 7.38	+ 2 35.49	+ 9.7	2 44 23.80	+ 0.27	59 57 13.8	- 0.9
	39	Weisse (2) 1047	.	9	45 45.23	+ 0.16	- 20.56	8 48 7.38	+ 1 36.18	+ 9.7	2 45 24.83	+ 0.27	59 56 14.5	- 0.9
	40	Weisse (2) 1255	.	9	54 36.59	+ 0.23	- 20.56	4 47 57.45	+ 7 8.96	+ 5.4	2 54 16.26	+ 0.20	56 1 33.0	+ 0.3
	41	Weisse (2) 1298	.	9	56 33.49	+ 0.23	- 20.56	4 47 57.45	+ 5 15.81	+ 5.3	2 56 13.16	+ 0.19	55 59 39.8	+ 0.3
	42	Weisse (2) 1312	.	9	57 15.91	+ 0.23	- 20.56	4 47 57.45	+ 4 41.03	+ 5.3	2 56 55.58	+ 0.18	55 59 5.0	+ 0.2
	43	ζ Arietis	.	9	8 48.09	+ 0.02	- 20.47	18 11 58.55	+ 3 38.72	+ 20.6	3 8 27.55	.	69 22 19.1	- 1.9
	44	Weisse (2) 373	.	9	20 19.36	+ 0.23	- 20.55	4 49 55.98	+ 1 27.37	+ 5.4	3 19 59.04	+ 0.06	55 57 50.0	- 0.1
	45	D. M. + 33°, 657	.	9	21 40.26	+ 0.23	- 20.55	4 49 55.98	+ 4 57.23	+ 5.4	3 21 19.94	+ 0.06	56 1 19.8	- 0.2
	46	Weisse (2) 458	.	9	24 45.97	+ 0.23	- 20.55	4 49 55.98	+ 4 19.77	+ 5.4	3 24 25.65	+ 0.03	56 0 42.4	- 0.2
	47	γ Eridani	.	9	53 9.22	- 0.38	- 20.57	52 38 4.85	+ 4 6.45	+ 1 22.1	3 52 48.30	.	103 49 54.6	- 1.4
	48	Lalande 7488	.	9	58 35.31	+ 0.30	- 20.54	1 24 3.10	+ 2 36.17	+ 1.6	3 58 15.07	- 0.17	52 33 2.1	+ 0.2
	49	Lalande 7603	.	9	1 11.77	+ 0.30	- 20.54	1 24 3.10	+ 3 35.25	+ 1.6	4 0 51.53	- 0.19	52 34 1.2	+ 0.1
	50	Lalande 7734	.	9	5 16.43	+ 0.30	- 20.54	1 24 3.10	+ 4 28.31	+ 1.6	4 4 56.19	- 0.21	52 34 54.2	0.0
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum
	in.	°	°						//		/ //	/ //	//	/ //
3	30.38	26.5	24.7	33, 37, 38, 40, 42. One bisection.				1 to 14	+ 73.74	17	- 18 59.0	+ 15 45.0	.	- 3 14.0
14	30.40	25.0	23.3	17, 41. Three bisections.				16 to 18	+ 72.19	25	- 7.5	- 16 15.3	.	- 16 22.8
16	29.88	15.5	12.4	27. Four bisections.				20 to 29	+ 70.72	26	- 7.5	+ 16 15.3	.	+ 16 7.8
17	.	.	12.4					30 to 50	+ 71.19	27	- 5.5	.	0.0	- 5.5
19	29.91	14.5	12.3											
20	29.94	12.0	11.6											
24	29.96	16.3	14.3											
26	29.93	17.5	15.8											
29	29.94	19.2	17.8											
32	29.95	17.2	16.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
February 13, W.					m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
	1	α Orionis	9	49	29.74	— 0.23	— 22.68	31 25 59.98	+ 4 2.93	+ 37.3	5 49 6.94	. .	82 37 1.4	— 1.6
	2	ν Orionis	9	1	33.76	— 0.13	— 22.55	24 1 59.80	+ 4 27.88	+ 27.3	6 1 11.06	. .	75 13 16.2	— 0.5
	3	δ Ursæ Minoris, S.P. . .	7	8	52.76	— 14.92	— 22.57	305 28 0.28	+ 3 33.88	— 1 25.2	18 8 15.27	. .	356 36 30.2	— 0.2
	4	μ Geminorum	9	16	34.16	— 0.02	— 22.56	16 16 0.88	+ 3 12.54	+ 17.9	6 16 11.56	. .	67 25 52.5	— 1.1
	5	γ Geminorum	9	31	37.64	— 0.11	— 22.51	22 20 1.48	+ 3 40.21	+ 25.1	6 31 14.95	. .	73 30 28.0	— 1.3
	6	D. M. + 24°, 1784 . . .	9.5	5	44 4.65	+ 0.01	— 22.60	14 44 0.65	+ 7 29.65	+ 16.2	7 43 42.06	— 0.75	65 58 7.7	— 6.4
	7	Anonymous	10.	5	44 8.08	+ 0.01	— 22.60	14 44 0.65	+ 7 23.90	+ 16.2	7 43 45.49	— 0.75	65 58 2.0	— 6.4
	8	Anonymous	9.5	6	44 15.38	+ 0.01	— 22.60	14 44 0.65	+ 8 26.63	+ 16.2	7 43 52.79	— 0.75	65 59 4.7	— 6.4
	9	Lalande (F) 1186 . . .	. .	9	47 9.45	+ 2.57	— 22.60	324 38 5.82	+ 3 18.25	— 43.3	7 46 49.42	— 2.80	15 47 2.0	+ 2.5
	10	Saturn I, N.	. .	6	15 21.98	— 0.05	— 22.61	18 26 3.02	+ 3 59.10	+ 20.5	8 14 59.32	+ 0.73	69 36 43.8	. .
	11	Saturn II, S.	. .	5	15 23.44	— 0.05	— 22.61	18 26 3.02	+ 4 17.82	+ 20.5	8 15 0.78	— 0.73	69 37 2.5	. .
	12	τ Leonis	. .	9	22 34.32	— 0.28	— 22.66	35 19 59.08	+ 4 37.20	+ 43.8	11 22 11.38	. .	86 31 41.3	— 1.8
	13	ν Leonis	. .	9	31 36.59	— 0.32	— 22.68	39 0 0.30	+ 5 11.79	+ 50.1	11 31 13.61	. .	90 12 23.4	— 1.3
	14	β Leonis	. .	9	43 44.20	— 0.12	— 22.65	23 38 . .	. .	. .	11 43 21.42	. .	74 48 . .	. .
	15	Anonymous	10.	9	1 25.25	— 0.32	— 22.67	38 44 1.12	+ 2 5.86	+ 49.7	12 1 2.26	— 0.65	89 53 17.9	— 4.2
17, P.	16	Venus II, C.	. .	9	40 50.97	— 0.88	— 22.75	59 40 29.72	+ 5 12.19	+ 1 40.6	19 40 27.34	— 0.50	110 53 43.7	. .
	17	γ Cygni	. .	9	18 33.64	+ 0.07	— 22.70	358 55 48.75	+ 4 2.12	— 1.0	20 18 10.94	. .	50 6 11.2	— 1.3
	18	α Cygni	. .	3	37 57.75	+ 0.20	— 22.82	353 58 10.00	+ 2 50.63	— 6.1	20 37 35.17	. .	45 7 15.7	— 1.5
	19	ζ Cygni	. .	9	8 31.53	— 0.14	— 22.83	9 4 6.08	+ 3 23.50	+ 9.4	21 8 8.59	. .	60 14 0.2	— 1.6
18	20	Sun I, S.	. .	9	5 54.98	— 0.75	— 22.83	50 42 11.65	+ 4 48.14	+ 1 11.4	22 5 31.40	+ 66.26	101 54 32.4	. .
	21	Sun II, N.	. .	9	8 7.50	— 0.75	— 22.83	50 10 8.52	+ 4 31.49	+ 1 10.0	22 7 43.92	— 66.26	101 22 11.2	. .
	22	Mercury I, C.	. .	9	11 53.71	— 0.64	— 22.86	42 20 8.10	+ 4 22.08	+ 53.3	23 11 30.21	+ 0.24	93 31 44.7	. .
	23	Polaris	. .	11	17 7.71	+ 37.25	— 22.93	310 7 58.62	+ 3 56.48	— 1 9.2	1 17 22.03	. .	1 17 7.1	— 1.4
	24	ξ^2 Ceti	. .	9	22 34.90	— 0.48	— 22.96	30 52 1.65	+ 3 42.77	+ 35.2	2 22 11.46	. .	82 2 40.8	— 1.6
	25	γ^2 Ceti	. .	9	37 52.61	— 0.56	— 22.97	36 4 7.95	+ 3 10.09	+ 42.9	2 37 29.08	. .	87 14 22.1	— 1.4
	26	α Ceti	. .	9	56 48.36	— 0.54	— 22.98	35 10 3.70	+ 4 3.57	+ 41.6	2 56 24.84	. .	86 21 10.1	— 2.0
	27	Moon I, S.	. .	9	4 7.27	— 0.44	— 22.98	27 29 51.12	+ 4 47.42	+ 30.8	3 3 43.85	+ 62.56	78 41 30.5	. .
23, W.	28	δ^1 (H) Cephei	. .	11	48 11.13	+ 0.68	— 14.12	311 38 9.25	+ 3 13.33	— 1 6.7	6 47 57.69	. .	2 46 37.1	— 0.4
	29	ϵ Canis Majoris	. .	9	55 28.13	+ 0.24	— 14.15	67 36 12.05	+ 4 33.17	+ 2 24.0	6 54 14.25	. .	118 49 30.4	— 0.9
	30	δ Canis Majoris	. .	9	5 4.97	+ 0.23	— 14.20	65 0 8.95	+ 4 36.21	+ 2 7.6	7 3 51.08	. .	116 13 14.0	— 0.4
	31	α^2 Geminorum	. .	9	28 41.82	+ 0.15	— 14.06	6 42 7.50	+ 3 27.64	+ 7.1	7 27 27.85	. .	57 52 3.4	— 0.1
	32	Moon I, N.	. .	9	30 40.86	+ 0.16	— 14.12	18 44 0.88	+ 3 9.88	+ 20.3	7 29 26.90	+ 69.21	69 53 52.3	. .
	33	β Geminorum	. .	9	39 42.31	+ 0.15	— 14.06	10 32 6.45	+ 3 40.45	+ 11.2	7 38 28.34	. .	61 42 19.3	— 0.3
March 2, E.	34	Venus II, N.	. .	9	51 54.99	— 0.16	— 15.01	56 40 12.22	+ 2 42.13	+ 1 29.8	20 51 39.82	— 0.46	107 50 45.4	. .
	35	ϵ Pegasi	. .	9	38 54.79	— 0.06	— 15.02	29 28 9.05	+ 3 19.80	+ 33.4	21 38 39.71	. .	80 38 23.4	— 1.1
3	36	Sun I, N.	. .	9	58 44.99	— 0.12	— 15.03	45 0 7.88	+ 3 24.76	+ 58.9	22 58 29.84	+ 65.20	96 10 52.7	. .
	37	Sun II, S.	. .	9	0 55.39	— 0.12	— 15.03	45 32 7.38	+ 3 43.10	+ 1 0.0	23 0 40.24	— 65.20	96 43 11.7	. .
	38	Polaris	. .	11	17 14.53	+ 12.85	— 15.06	310 8 5.62	+ 3 52.30	— 1 9.2	1 17 12.32	. .	1 17 9.9	— 1.7
	39	β Arietis	. .	9	48 41.13	— 0.01	— 15.05	18 34 14.40	+ 3 34.19	+ 19.7	1 48 26.06	. .	69 44 29.5	— 0.5
	40	α Arietis	. .	9	1 5.60	0.00	— 15.08	15 54 10.40	+ 3 20.43	+ 16.7	2 0 50.53	. .	67 4 8.7	— 0.5
5, W.	41	ζ Cygni	. .	9	8 23.68	+ 0.12	— 15.00	9 4 . .	. .	. .	21 8 8.84	. .	60 14 . .	. .
	42	ϵ Pegasi	. .	9	38 54.73	— 0.07	— 14.91	29 27 56.48	+ 3 31.40	+ 34.8	21 38 39.71	. .	80 38 23.9	— 0.8
6	43	Sun I, S.	. .	9	9 52.99	— 0.18	— 14.95	44 21 58.55	+ 4 13.53	+ 59.8	23 9 37.86	+ 64.96	95 33 33.1	. .
	44	Sun II, N.	. .	9	12 2.91	— 0.18	— 14.95	43 50 1.32	+ 3 56.96	+ 58.7	23 11 47.78	— 64.96	95 1 18.2	. .
	45	Polaris	. .	8	17 1.03	+ 24.80	— 14.94	310 8 1.02	+ 4 1.28	— 1 11.7	1 17 10.89	. .	1 17 11.8	— 0.5
	46	β Arietis	. .	9	48 40.94	+ 0.02	— 14.93	18 33 59.20	+ 3 49.05	+ 20.4	1 48 26.02	. .	69 44 29.8	— 0.5
	47	α Arietis	. .	9	1 5.39	+ 0.04	— 14.95	15 53 59.95	+ 3 31.09	+ 17.3	2 0 50.49	. .	67 4 9.5	+ 0.1
	48	Moon II	. .	9	17 0.28	— 0.31	— 14.84	60 0 . .	. .	. .	19 16 45.13	— 69.40	110 23 . .	. .
	49	δ Aquilæ	. .	9	20 5.14	— 0.14	— 14.84	35 56 . .	. .	. .	19 19 50.16	. .	87 7 . .	. .
	50	γ Aquilæ	. .	9	41 9.99	— 0.09	— 14.80	28 28 . .	. .	. .	19 40 55.06	. .	79 40 . .	. .

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3	Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum
	in.	°	°			"		' "	' "	"	' "
5	30.11	32.4	29.8	6, 7, 8. One bisection.	1 to 15	+ 72.36	10	— 0.4	+ 9.3	. .	+ 8.9
13	30.09	27.5	24.0		16 to 27	+ 69.92	11	— 0.4	— 9.4	. .	— 9.8
15	30.09	26.5	22.4	3, 27, 32, 38, 45. Three bisections.	28 to 33	+ 71.14	16	— 6.2	. .	+ 0.2	— 6.0
16	29.86	37.5	43.5	16. Four bisections.	34 to 40	+ 71.64	20	— 6.9	— 16 10.6	. .	— 16 17.5
17	29.90	43.5	48.7		42 to 47	+ 73.67	21	— 6.8	+ 16 10.6	. .	+ 16 3.8
18	29.92	45.5	49.2				22	— 6.6	. .	— 0.8	— 7.4
19	29.93	46.5	49.3				27	— 24 55.7	— 14 48.6	. .	— 39 44.3
21	29.95	47.8	48.8				32	— 18 14.2	+ 15 37.5	. .	— 2 36.7
22	29.97	47.5	48.8				34	— 5.6	+ 6.5	. .	+ 0.9
23	30.02	48.0	48.3				36	— 6.3	+ 16 9.5	. .	+ 16 3.2
24	30.05	46.5	46.6				37	— 6.3	— 16 9.5	. .	— 16 15.8
27	30.05	45.5	45.5				43	— 6.2	— 16 7.4	. .	— 16 13.6
29	30.10	43.0	41.3				44	— 6.1	+ 16 7.4	. .	+ 16 1.3
32	30.09	41.1	39.1								
34	30.07	44.5	44.5								
37	30.08	46.5	46.8								
40	30.05	49.0	49.5								
42	29.90	23.9	23.1								
44	29.90	27.5	26.2								
46	29.88	30.5	29.5								
49	29.98	27.5	30.0								

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
March					m. s.	s.	s.	° / //	/ //	/ //	h. m. s.	s.	° / //	//
6, W.	1	a Aquilæ	9	45	33.10	— 0.10	— 14.89	30 16 . . .	. . .	. . .	19 45 18.16	. . .	81 26 . . .	. . .
E.	2	a Cygni	9	37	49.92	+ 0.35	— 14.78	353 57 57.90	+ 3 6.59	— 6.4	20 37 35.47	. . .	45 7 19.3	— 2.2
	3	v Cygni	9	53	13.01	+ 0.28	— 14.79	358 5 59.08	+ 3 40.13	— 1.9	20 52 58.49	. . .	49 15 58.5	— 1.2
	4	ζ Cygni	9	8	23.52	+ 0.13	— 14.83	9 4 5.08	+ 3 26.65	+ 9.7	21 8 8.85	. . .	60 14 2.6	— 2.7
	5	Venus II	9	11	45.99	— 0.28	— 14.80	55 28 . . .	. . .	. . .	21 11 30.91	— 0.44	106 39 . . .	. . .
7	6	Sun I, S.	9	13	34.78	— 0.19	— 14.82	44 0 7.68	+ 2 42.58	+ 58.0	23 13 19.97	+ 64.87	95 10 9.5	. . .
	7	Sun II, N.	9	15	44.73	— 0.19	— 14.82	43 28 12.38	+ 2 25.08	+ 56.9	23 15 29.72	— 64.88	94 37 55.6	. . .
	8	a Andromedæ	9	2	49.26	+ 0.11	— 14.88	10 22 4.70	+ 3 8.36	+ 11.0	0 2 34.54	. . .	61 31 45.3	— 1.8
	9	Polaris	7	16	59.34	+ 25.85	— 14.84	310 8 0.25	+ 3 59.62	— 1 10.7	1 17 10.35	. . .	1 17 10.4	— 2.1
	10	a Arietis	9	1	5.23	+ 0.05	— 14.81	15 54 5.65	+ 3 24.02	+ 17.1	2 0 50.43	. . .	67 4 8.0	— 1.5
	11	a Ceti	9	56	39.54	— 0.12	— 14.85	35 10 4.05	+ 4 3.09	+ 42.1	2 56 24.56	. . .	86 21 10.4	— 2.0
S.	12	Moon II	9	14	35.00	— 0.57	— 14.40	58 19 . . .	. . .	. . .	20 14 20.03	— 68.11	109 11 . . .	. . .
	13	γ Cygni	9	18	25.48	+ 0.19	— 14.25	358 56 1.32	+ 3 53.82	— 1.1	20 18 11.27	. . .	50 6 15.2	— 1.4
	14	a Cygni	9	37	49.58	+ 0.29	— 14.36	353 58 12.02	+ 2 52.63	— 6.3	20 37 35.47	. . .	45 7 19.5	— 2.2
	15	ζ Cygni	4	8	23.36	+ 0.01	— 14.53	9 4 3.78	+ 3 29.50	+ 9.7	21 8 8.98	. . .	60 14 4.2	— 1.2
	16	Venus I, S.	6	16	40.22	— 0.52	— 14.39	55 8 10.22	+ 4 17.72	+ 1 26.3	21 16 25.31	+ 0.35	106 20 15.4	. . .
	17	Venus II, N.	5	16	41.06	— 0.52	— 14.39	55 8 10.22	+ 4 3.88	+ 1 26.3	21 16 26.15	— 0.49	106 20 1.6	. . .
	18	β² Cephei	8	27	23.18	+ 1.52	— 14.39	328 46 1.65	+ 4 12.56	— 36.3	21 27 10.31	. . .	19 55 59.1	— 0.8
	19	ε Pegasi	9	38	54.46	— 0.25	— 14.44	29 28 4.65	+ 3 24.04	+ 34.0	21 38 39.82	. . .	80 38 23.9	— 0.9
8	20	Sun I, S.	9	17	16.04	— 0.40	— 14.38	43 36 6.52	+ 3 21.37	+ 57.0	23 17 1.26	+ 64.84	94 46 46.1	. . .
	21	Sun II, N.	9	19	25.71	— 0.40	— 14.38	43 4 7.72	+ 3 8.56	+ 55.9	23 19 10.93	— 64.83	94 14 33.4	. . .
	22	a Andromedæ	9	2	48.83	— 0.01	— 14.33	10 22 12.48	+ 3 0.43	+ 11.0	0 2 34.45	. . .	61 31 45.1	— 2.2
	23	γ Pegasi	3	7	41.34	— 0.19	— 14.44	24 16 10.08	+ 3 30.37	+ 26.9	0 7 26.78	. . .	75 26 28.5	— 0.8
	24	β Andromedæ	9	3	40.60	+ 0.09	— 14.33	3 48 9.12	+ 3 53.75	+ 4.0	1 3 26.33	. . .	54 58 28.1	— 0.9
	25	Polaris	7	16	52.99	+ 31.26	— 14.36	310 8 0.75	+ 3 58.62	— 1 10.1	1 17 9.89	. . .	1 17 10.5	— 2.3
P.	26	ζ Cygni	9	8	23.20	— 0.03	— 14.31	9 4 9.38	+ 3 22.33	+ 9.7	21 8 8.86	. . .	60 14 2.6	— 3.0
	27	1 Pegasi	9	17	7.56	— 0.16	— 14.29	19 30 5.70	+ 3 45.30	+ 21.5	21 16 53.10	. . .	70 40 33.7	— 2.5
	28	Venus II, C.	9	21	35.56	— 0.52	— 14.30	54 46 6.75	+ 6 39.92	+ 1 25.6	21 21 20.74	— 0.44	106 0 33.5	. . .
	29	a Aquarii	9	0	15.13	— 0.37	— 14.31	39 42 9.65	+ 2 33.10	+ 50.1	22 0 0.46	. . .	90 51 54.1	— 1.8
9	30	Sun I, S.	9	20	57.09	— 0.40	— 14.29	43 12 11.55	+ 3 47.03	+ 56.3	23 20 42.40	+ 64.76	94 23 16.1	. . .
	31	Sun II, N.	9	23	6.61	— 0.40	— 14.29	42 40 9.80	+ 3 38.06	+ 55.3	23 22 51.92	— 64.76	93 51 4.4	. . .
	32	β Andromedæ	9	3	40.58	+ 0.05	— 14.27	3 48 4.18	+ 3 57.82	+ 4.0	1 3 26.35	. . .	54 58 27.2	— 1.9
	33	Polaris	7	16	54.71	+ 28.75	— 14.28	310 8 . . .	. . .	. . .	1 17 9.18	. . .	1 17 . . .	. . .
	34	η Piscium	9	25	42.67	— 0.21	— 14.29	24 4 . . .	. . .	. . .	1 25 28.18	. . .	75 14 . . .	. . .
	35	λ Ursæ Minoris, S. P.	3	36	4.93	— 34.24	— 14.35	307 48 . . .	. . .	. . .	19 35 16.34	. . .	358 58 . . .	. . .
	36	φ Geminorum	9	46	53.41	— 0.03	— 14.32	11 46 . . .	. . .	. . .	7 46 39.03	. . .	62 57 . . .	. . .
	37	15 Argus	9	3	2.14	— 0.48	— 14.40	62 46 6.55	+ 4 44.12	+ 1 57.6	8 2 47.31	. . .	113 59 9.5	— 2.1
	38	Saturn I, C.	7	9	26.19	— 0.10	— 14.35	18 4 3.50	+ 6 25.69	+ 19.9	8 9 11.74	+ 0.64	69 17 10.3	. . .
	39	Saturn II	7	9	27.48	— 0.10	— 14.35	18 4 . . .	. . .	. . .	8 9 13.03	— 0.65	. . .	. . .
	40	η Cancri	9	26	29.02	— 0.10	— 14.33	18 0 7.10	+ 4 1.57	+ 19.8	8 26 14.57	. . .	69 10 49.7	— 1.1
W.	41	γ Cygni	9	18	25.33	+ 0.13	— 13.99	358 56 3.52	+ 3 51.56	— 1.1	20 18 11.38	. . .	50 6 15.2	— 1.7
	42	a Cygni	9	37	49.40	+ 0.22	— 14.06	353 58 3.58	+ 3 2.13	— 6.3	20 37 35.54	. . .	45 7 20.6	— 1.5
	43	ζ Cygni	9	8	23.08	0.00	— 14.20	9 4 4.02	+ 3 27.59	+ 9.7	21 8 8.99	. . .	60 14 2.5	— 3.2
	44	Venus II, N.	9	26	28.74	— 0.42	— 14.09	54 28 7.80	+ 4 32.07	+ 1 24.1	21 26 14.23	— 0.44	105 40 25.2	. . .
	45	Venus S.	. . .	. . .	. . .	. . .	. . .	54 28 7.80	+ 4 48.00	+ 1 24.2	. . .	. . .	105 40 41.2	. . .
10	46	Sun I, S.	9	24	37.82	— 0.32	— 14.11	42 48 11.92	+ 4 16.96	+ 55.0	23 24 23.39	+ 64.68	93 59 45.1	. . .
	47	Sun II, N.	9	26	47.18	— 0.32	— 14.11	42 16 10.48	+ 4 5.83	+ 54.0	23 26 32.75	— 64.68	93 27 31.5	. . .
	48	β Andromedæ	9	3	40.42	+ 0.06	— 14.13	3 48 9.05	+ 3 53.97	+ 4.0	1 3 26.35	. . .	54 58 28.2	— 1.1
	49	Polaris	9	16	58.07	+ 24.64	— 14.13	310 8 7.40	+ 3 53.64	— 1 9.6	1 17 8.58	. . .	1 17 12.6	— 0.7
14, W.	50	15 Argus	9	3	1.28	— 0.72	— 13.39	62 45 58.92	+ 4 52.94	+ 1 57.9	8 2 47.29	. . .	113 59 11.0	— 1.1

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B. 3		Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°				//		/ //	/ //	//	/ //
2	29.98	27.5	30.2	9. Three bisections. 28, 38. Four bisections.		2 to 11	+ 72.32	6	— 6.2	— 16 6.9	.	— 16 13.1
7	29.96	33.5	35.3			13 to 25	+ 72.29	7	— 6.1	+ 16 6.9	.	+ 16 0.8
11	29.94	38.0	38.0			26 to 32	+ 70.90	16	— 5.4	— 7.0	+ 0.2	— 12.2
13	30.09	34.	35.2			37 to 40	+ 72.06	17	— 5.4	+ 7.0	.	+ 1.6
21	30.11	39.5	39.7			41 to 49	+ 70.57	20	— 6.1	— 16 6.3	.	— 16 12.4
25	30.10	44.5	42.9			50	+ 72.31	21	— 6.0	+ 16 6.3	.	+ 16 0.3
26	30.34	36.5	38.3					28	— 5.4	.	+ 0.3	— 5.1
29	30.34	39.0	39.3					30	— 6.1	— 16 5.8	.	— 16 11.9
31	30.34	41.3	42.3					31	— 6.0	+ 16 5.8	.	+ 15 59.8
32	30.31	44.0	45.8					38	— 0.3	.	.	— 0.3
37	30.37	39.5	37.6					44	— 5.3	+ 8.1	.	+ 2.8
40	30.38	39.0	36.6					45	— 5.3	— 8.1	+ 0.2	— 13.2
41	30.41	35.8	36.8					46	— 6.0	— 16 6.8	.	— 16 12.8
45	30.40	40.8	42.0					47	— 6.0	+ 16 6.8	.	+ 16 0.8
47	30.38	46.5	47.8									
49	30.33	51.7	51.8	49	Read at 2 ^h 0 ^m .							

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
March 14, W.	1	Saturn I, N.	6	8	43.48	— 0.14	— 13.27	18 3 57.92	+ 3 59.67	+ 19.9	8 8 30.07	+ 0.68	69 14 38.7	. .
	2	Saturn II, S.	5	8	44.84	— 0.14	— 13.27	18 3 57.92	+ 4 18.81	+ 19.9	8 8 31.43	— 0.68	69 14 57.8	. .
	3	η Cancri	9	26	27.87	— 0.14	— 13.20	18 0 3.82	+ 4 4.27	+ 19.8	8 26 14.46	. .	69 10 49.1	— 1.4
	4	ϵ^2 Hydræ	9	41	4.93	— 0.34	— 13.22	32 0 2.25	+ 3 21.33	+ 38.1	8 40 51.32	. .	83 10 22.9	— 1.7
	5	σ^2 Ursæ Majoris	9	0	45.19	+ 1.54	— 13.27	331 13 59.75	+ 4 48.14	— 33.3	9 0 33.46	. .	22 24 35.8	— 0.6
E.	6	ν Cygni	9	53	11.54	+ 0.22	— 13.07	358 5 58.98	+ 3 41.49	— 1.9	20 52 58.68	. .	49 15 59.8	— 1.4
	7	ζ Cygni	9	8	22.01	+ 0.01	— 13.04	9 4 5.82	+ 3 27.45	+ 9.8	21 8 8.94	. .	60 14 4.3	— 2.2
	8	α Cephei	9	16	4.58	+ 1.02	— 13.08	336 44 2.55	+ 3 31.94	— 26.0	21 15 52.52	. .	27 53 29.7	— 1.4
	9	ϵ Pegasi	9	38	53.30	— 0.28	— 13.13	29 28 2.90	+ 3 24.87	+ 34.3	21 38 39.95	. .	80 38 23.3	— 1.9
	10	Venus II, N.	9	50	40.74	— 0.57	— 13.07	52 42 13.68	+ 4 2.48	+ 19.5	21 50 27.10	— 0.42	103 53 56.9	. .
15	11	Sun I, S.	9	42	56.36	— 0.42	— 13.05	40 50 12.55	+ 4 6.37	+ 52.0	23 42 42.89	+ 64.56	92 1 32.1	. .
	12	Sun II, N.	9	45	5.48	— 0.42	— 13.05	40 18 3.15	+ 4 5.14	+ 51.0	23 44 52.01	— 64.56	91 29 20.5	. .
	13	β Andromedæ	9	3	39.20	+ 0.10	— 12.98	3 48 4.32	+ 3 59.19	+ 4.0	1 3 26.27	. .	54 58 28.7	— 1.4
	14	Polaris	11	16	44.52	+ 35.04	— 13.03	310 7 55.72	+ 4 5.89	— 10.1	1 17 6.53	. .	1 17 12.7	— 2.1
	15	β Arietis	9	48	39.16	— 0.14	— 13.07	18 34 5.80	+ 3 42.46	+ 20.0	1 48 26.00	. .	69 44 29.5	— 1.5
	16	Moon I	9	59	1.26	— 0.33	— 13.02	32 28 . . .	. . .	. .	1 58 47.91	+ 61.38	87.4 . . .	. .
	17	α Arietis	9	1	3.52	— 0.10	— 13.02	15 53 59.52	+ 3 32.14	+ 16.9	2 0 50.40	. .	67 4 9.8	— 0.4
	18	δ^1 Geminorum	6	13	39.23	— 0.10	— 12.97	16 38 9.65	+ 4 5.74	+ 17.9	7 13 26.16	— 0.23	67.48 54.5	— 5.3
	19	δ^2 Geminorum	5	13	39.44	— 0.10	— 13.05	16 38 9.65	+ 3 59.74	+ 17.9	7 13 26.37	. .	67 48 48.5	— 1.2
	20	Piazzi VII, 67	5	19	25.48	+ 1.57	— 12.98	330 8 10.98	+ 4 17.47	— 34.2	7 19 14.07	. .	21 18 15.4	— 0.9
	21	α^1 Geminorum	6	27	40.05	+ 0.06	— 12.98	6 42 8.80	+ 3 27.76	+ 7.1	7 27 27.13	— 0.31	57 52 4.9	— 2.0
	22	α^2 Geminorum	5	27	40.45	+ 0.06	— 12.93	6 42 8.80	+ 3 24.44	+ 7.1	7 27 27.53	. .	57 52 1.5	— 0.3
	23	λ Ursæ Minoris, S.P.	5	36	21.05	— 44.81	— 12.99	307 48 8.55	+ 4 17.80	— 16.8	19 35 23.25	. .	358 57 30.8	— 1.0
	24	ϕ Geminorum	9	46	51.97	— 0.03	— 12.97	11 46 8.82	+ 4 1.32	+ 12.5	7 46 38.94	. .	62 56 43.8	— 2.2
	25	Lalande (F) 1192	9	2	58.08	+ 5.84	— 13.01	316 4 8.05	+ 3 47.30	— 57.6	8 2 50.91	— 3.55	7 13 19.0	+ 10.6
	26	Saturn I, S.	6	8	36.20	— 0.13	— 13.01	18 4 8.42	+ 3 43.96	+ 19.7	8 8 23.06	+ 0.70	69 14 33.3	. .
	27	Saturn II, N.	5	8	37.60	— 0.13	— 13.01	18 4 8.42	+ 3 25.90	+ 19.6	8 8 24.46	— 0.70	69 14 15.1	. .
	28	Anonymous	11.5	9	29 45.97	— 0.11	— 13.03	17 8 9.58	+ 1 17.86	+ 18.6	8 29 32.83	— 0.58	68 16 7.2	— 5.5
	29	ϵ^1 Hydræ	3	40	44.20	— 0.31	— 13.04	32 0 7.35	+ 3 18.60	+ 37.7	8 40 30.85	— 0.64	83 10 24.9	— 9.4
	30	ϵ^2 Hydræ	8	41	4.71	— 0.31	— 13.04	32 0 7.35	+ 3 17.23	+ 37.7	8 40 51.36	. .	83 10 23.5	— 1.1
	31	κ Cancri	9	1	54.88	— 0.26	— 13.02	27 42 4.65	+ 4 2.34	+ 31.8	9 1 41.56	. .	78 53 0.0	— 1.8
	32	α Hydræ	9	22	19.52	— 0.49	— 13.12	47 0 7.52	+ 3 1.03	+ 4.9	9 22 5.96	. .	98 10 34.7	— 3.4
	33	ϵ Leonis	9	39	43.58	— 0.07	— 13.08	14 32 10.35	+ 3 53.47	+ 15.8	9 39 30.42	. .	65 42 40.8	— 2.4
	34	Anonymous	11.0	9	46 33.62	— 0.19	— 13.09	22 46 9.98	+ 7 16.40	+ 25.6	9 46 20.34	— 0.83	74 0 13.2	— 6.9
18, W.	35	ζ Persei	9	47	17.83	+ 0.03	— 13.22	7 18 10.80	+ 2 21.75	+ 7.6	3 47 4.56	. .	58 27 1.4	— 1.6
	36	γ Eridani	9	53	1.17	— 0.39	— 13.37	52 38 11.45	+ 4 4.41	+ 17.3	3 52 47.49	. .	103 49 54.4	— 2.1
	37	Moon I, S.	9	22	53.98	— 0.13	— 13.24	22 21 52.28	+ 3 22.47	+ 24.4	4 22 40.61	+ 64.31	73 32 0.4	. .
	38	α Tauri	9	29	42.38	— 0.13	— 13.26	22 31 59.35	+ 4 22.74	+ 24.6	4 29 29.02	. .	73 43 7.9	— 0.2
	39	α Camelopardalis	9	43	6.30	+ 0.93	— 13.21	332 42 0.45	+ 2 56.47	— 30.4	4 42 54.02	. .	23 50 47.7	— 0.9
E.	40	ι Aurigæ	9	49	54.56	+ 0.05	— 13.18	5 50 9.05	+ 4 7.76	+ 6.1	4 49 41.41	. .	57 0 44.1	— 1.8
	41	51 (H) Cephei	11	47	48.76	+ 12.80	— 13.23	311 38 8.75	+ 3 9.06	— 7.0	6 47 48.33	. .	2 46 32.0	— 2.0
	42	δ Canis Majoris	9	4	4.37	— 0.51	— 13.31	65 0 8.68	+ 4 36.33	+ 2 8.0	7 3 50.62	. .	116 13 14.2	— 2.6
	43	δ^1 Geminorum	6	13	39.27	— 0.05	— 13.24	16 38 11.20	+ 4 3.10	+ 18.0	7 13 25.98	— 0.18	67 48 53.5	— 5.3
	44	δ^2 Geminorum	5	13	39.48	— 0.05	— 13.19	16 38 11.20	+ 3 56.36	+ 18.0	7 13 26.19	. .	67 48 46.8	— 2.8
	45	Saturn I, S.	6	8	17.90	— 0.06	— 13.24	18 2 6.60	+ 4 39.41	+ 19.7	8 8 4.60	+ 0.74	69 13 26.9	. .
	46	Saturn II, N.	5	8	19.38	— 0.06	— 13.24	18 2 6.60	+ 4 26.32	+ 19.6	8 8 6.08	— 0.74	69 13 13.7	. .
	47	Anonymous	11.5	9	29 46.21	— 0.05	— 13.25	17 7 54.92	+ 1 28.56	+ 18.6	8 29 32.91	— 0.54	68 16 3.3	— 5.4
	48	ϵ Hydræ	9	41	4.74	— 0.20	— 13.22	32 0 8.05	+ 3 15.46	+ 37.7	8 40 51.29	. .	83 10 22.4	— 2.2
	49	κ Cancri	9	1	54.97	— 0.16	— 13.25	27 42 11.88	+ 3 54.45	+ 31.7	9 1 41.56	. .	78 52 59.2	— 2.5
	50	α Hydræ	9	22	19.53	— 0.34	— 13.31	47 0 10.38	+ 2 59.44	+ 4.8	922 5.94	. .	98 10 35.8	— 2.6
For summary of the constants of reduction, see page B.3														
No.	Barom.	At. Ther.	Ex. Ther.					Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Cor. for Def. Illum.	Sum
	in.	°	°						"		"	"	"	"
2	30.08	31.5	31.5	14, 23, 25, 37, 41. Three bisections.				1 to 5	+ 72.31	1	— 0.3	+ 9.5	.	+ 9.2
5	30.08	30.7	30.7					6 to 17	+ 72.11	2	— 0.3	— 9.6	.	— 9.9
6	30.23	32.0	34.0	32, 34. Four bisections.				18 to 34	+ 72.53	10	— 5.1	+ 6.2	.	+ 1.1
12	30.21	37.5	39.4					35 to 40	+ 71.16	11	— 5.8	— 16 5.8	.	— 16 11.6
14	30.18	43.5	44.0					41 to 50	+ 71.37	12	— 5.7	+ 16 5.8	.	+ 16 0.1
17	30.15	44.5	45.0							26	— 0.3	— 9.1	.	— 9.4
19	30.12	40.5	40.5							27	— 0.3	+ 9.1	.	+ 8.8
34	30.09	35.0	32.5							37	— 20 34.0	— 14 51.4	.	— 35 25.4
36	30.01	42.8	44.2							45	— 0.3	— 6.6	.	— 6.9
40	30.02	43.3	43.7							46	— 0.3	+ 6.6	.	+ 6.3
41	30.06	40.3	39.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
March 18, E.	1	ε Leonis	.	9	m. s. 39 43.63	s. — 0.02	— 13.20	° / // 14 32 9.80	/ // + 3 53.62	/ // — 15.8	h. m. s. 9 39 30.35	s. .	° / // 65 42 40.4	// — 2.5
	2	Anonymous . . .	11.3	9	46 33.80	— 0.11	— 13.26	22 46 8.82	+ 7 16.20	+ 25.5	9 46 20.43	— 0.81	74 0 11.7	— 6.8
19	3	α Pegasi	.	9	59 22.99	— 0.28	— 13.12	24 14 . . .	. . .	. . .	22 59 9.65	.	75 24 . . .	. .
	4	Sun I, S.	.	9	57 31.89	— 0.44	— 13.08	39 16 1.62	+ 3 30.10	+ 47.8	23 57 18.37	+ 64.51	90 26 40.7	. .
	5	Sun II, N.	.	9	59 40.91	— 0.44	— 13.08	38 44 3.65	+ 3 18.38	+ 46.9	23 59 27.39	— 64.51	89 54 30.1	. .
	6	β Andromedæ . . .	.	9	3 39.34	0.00	— 13.04	3 48 10.82	+ 3 53.21	+ 3.9	1 3 26.24	.	54 58 29.1	— 1.6
	7	Polaris	.	7	16 48.91	+ 29.22	— 13.11	310 8 . . .	. . .	. . .	1 17 5.02	.	1 17 . . .	. .
	8	α Arietis	.	9	1 3.67	— 0.18	— 13.12	15 54 4.00	+ 3 27.40	+ 16.6	2 0 50.37	.	67 4 9.2	— 1.4
	9	α Tauri	.	9	29 42.36	— 0.26	— 13.12	22 32 6.22	+ 4 14.74	+ 24.1	4 29 28.92	.	73 43 6.3	— 1.8
	10	ι Aurigæ	.	9	49 54.57	— 0.03	— 13.13	5 50 12.42	+ 3 3.96	+ 6.0	4 49 41.36	.	57 0 43.7	— 2.3
	11	ιι Orionis	.	9	58 23.06	— 0.27	— 13.17	23 34 5.75	+ 4 24.46	+ 25.4	4 58 9.60	.	74 45 16.8	— 1.4
	12	β Orionis	.	9	9 22.61	— 0.52	— 13.23	47 10 10.05	+ 2 33.38	+ 1 2.5	5 9 8.90	.	98 20 7.1	— 3.0
	13	Moon I, S.	.	9	14 18.68	— 0.24	— 13.19	20 12 13.78	+ 3 55.02	+ 21.4	5 14 5.25	+ 65.74	71 22 51.4	. .
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum
	in.	°	°						//		/ //	/ //	//	/ //
1	30.12	36.0	34.2	7, 13. Three bisections.				1 and 2	+ 71.37	4	— 5.6	— 16 5.3	.	— 16 10.9
3	30.18	45.5	47.5					4 to 13	+ 68.74	5	— 5.5	+ 16 5.3	.	+ 15 59.8
5	30.16	50.0	52.0							13	— 18 48.9	— 14 58.6	.	— 33 47.5
13	30.10	55.0	55.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
August 2, W.					m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	' "
	1	Venus I, S. . .	.	6	19 9.90	+ 0.02	- 16.59	21 43 49.70	+ 5 47.00	+ 21.9	9 18 53.33	+ 0.26	72 56 19.8	. .
	2	Venus II, N. . .	.	5	19 10.42	+ 0.02	- 16.59	21 43 49.70	+ 5 36.44	+ 21.9	9 18 53.85	- 0.26	72 56 9.2	. .
	3	<i>a</i> Ursæ Majoris . .	.	9	57 2.29	+ 1.28	- 16.63	336 27 57.30	+ 4 41.10	- 23.6	10 56 46.94	. .	27 38 36.0	+ 1.1
6, P.	4	<i>ε</i> Canis Majoris . .	.	9	54 31.92	- 0.16	- 18.79	67 35 53.65	+ 4 42.59	+ 2 11.1	6 54 12.05	. .	118 49 8.5	- 0.8
	5	<i>α</i> ² Geminorum . .	.	9	27 45.12	+ 0.48	- 18.62	6 41 48.50	+ 3 48.89	+ 6.4	7 27 26.87	. .	57 52 5.0	- 0.2
	6	<i>a</i> Canis Minoris . .	.	9	33 44.77	+ 0.16	- 18.81	33 17 55.80	+ 4 28.68	+ 35.7	7 33 26.20	. .	84 29 21.4	+ 0.8
	7	<i>β</i> Geminorum . .	.	9	38 45.71	+ 0.42	- 18.69	10 31 46.20	+ 4 0.96	+ 10.1	7 38 27.39	. .	61 42 18.5	- 0.9
	8	Mercury C. . .	.	9	6 57.76	+ 0.32	- 18.75	18 15 53.82	+ 4 42.01	+ 17.9	8 6 39.33	- 0.05	69 27 14.9	. .
7	9	Sun I, N. . .	.	9	11 15.54	+ 0.27	- 18.79	22 21 52.48	+ 4 40.04	+ 22.3	9 10 57.02	+ 65.93	73 33 16.0	. .
	10	Sun II, S. . .	.	9	13 27.40	+ 0.27	- 18.79	22 53 52.05	+ 4 13.86	+ 22.9	9 13 8.88	- 65.93	74 4 50.0	. .
	11	<i>α</i> ² Canum Venat. . .	.	9	51 5.41	+ 0.60	- 18.86	359 53 51.82	+ 4 12.56	0.0	12 50 47.10	. .	51 4 25.6	- 0.6
	12	<i>ε</i> Virginis . . .	.	9	56 55.07	+ 0.22	- 18.91	27 15 55.60	+ 3 31.43	+ 27.7	12 56 36.37	. .	78 26 15.9	+ 0.3
	13	<i>θ</i> Virginis . . .	.	9	4 28.36	+ 0.06	- 18.94	43 45 56.12	+ 3 19.49	+ 51.4	13 4 9.50	. .	94 56 28.2	+ 0.2
	14	Polaris, s. p. . .	.	9	19 21.07	- 33.33	- 18.93	307 33 53.40	+ 3 22.66	- 1 9.5	1 18 28.81	. .	358 42 27.8	+ 0.3
	15	<i>a</i> Virginis . . .	.	9	19 37.06	+ 0.01	- 18.97	49 21 54.60	+ 5 20.18	+ 1 2.6	13 19 18.14	. .	100 34 38.6	+ 0.9
	16	<i>γ</i> Geminorum . .	.	9	31 34.04	+ 0.25	- 19.77	22 19 52.58	+ 3 48.52	+ 22.4	6 31 14.49	. .	73 30 24.7	+ 0.2
	17	<i>ε</i> Canis Majoris . .	.	9	54 33.06	- 0.23	- 19.84	67 35 56.30	+ 4 39.78	+ 2 11.2	6 54 13.01	. .	118 49 8.5	- 0.6
	18	<i>δ</i> Canis Majoris . .	.	8	4 9.82	- 0.20	- 19.83	65 0 . .	. .	. .	7 3 49.80	. .	63 47 . .	. .
	19	Mercury II, C. .	.	9	14 20.34	+ 0.30	- 19.85	18 25 53.75	+ 5 17.35	+ 18.0	8 14 0.79	- 0.21	69 37 50.3	. .
8	20	Sun I, N. . .	.	9	15 5.59	+ 0.24	- 19.88	22 37 59.92	+ 5 43.81	+ 22.4	9 14 45.95	+ 65.86	73 50 27.3	. .
	21	Sun II, S. . .	.	9	17 17.33	+ 0.24	- 19.89	23 9 48.82	+ 5 29.39	+ 23.0	9 16 57.68	- 65.87	74 22 2.4	. .
	22	<i>α</i> ² Canum Venat. . .	.	8	51 6.52	+ 0.61	- 19.99	359 53 52.45	+ 4 12.86	0.0	12 50 47.14	. .	51 4 26.5	+ 0.2
	23	Polaris, s. p. . .	.	4	19 24.79	- 36.22	- 20.00	307 33 48.92	+ 3 26.32	- 1 8.6	1 18 28.57	. .	358 42 27.8	+ 0.1
	24	<i>α</i> ² Geminorum . .	.	9	27 47.68	+ 0.45	- 21.11	6 41 46.90	+ 3 50.37	+ 6.5	7 27 27.01	. .	57 52 5.0	- 0.3
	25	<i>a</i> Canis Minoris . .	.	9	33 47.23	+ 0.04	- 21.12	33 17 55.60	+ 4 28.56	+ 36.1	7 33 26.15	. .	84 29 21.5	+ 1.0
	26	<i>β</i> Geminorum . .	.	9	38 48.24	+ 0.38	- 21.14	10 31 46.68	+ 4 0.61	+ 10.3	7 38 27.49	. .	61 42 18.8	- 0.7
	27	Mercury II, C. .	.	9	21 55.83	+ 0.24	- 21.17	18 39 49.95	+ 4 34.02	+ 18.5	8 21 34.90	- 0.21	69 51 3.7	. .
9	28	Sun I, N. . .	.	5	18 54.86	+ 0.17	- 21.23	22 55 56.00	+ 5 11.07	+ 23.1	9 18 33.80	+ 65.93	74 7 51.4	. .
	29	Sun II, S. . .	.	9	21 6.72	+ 0.17	- 21.23	23 27 57.10	+ 4 44.78	+ 23.7	9 20 45.66	- 65.93	74 39 26.8	. .
	30	<i>β</i> Leonis . . .	.	2	43 41.90	+ 0.17	- 21.37	23 36 . .	. .	. .	11 43 20.70	. .	74 48 . .	. .
	31	<i>a</i> Canis Minoris . .	.	9	33 48.63	- 0.05	- 22.41	33 18 0.40	+ 4 22.06	+ 36.8	7 33 26.19	. .	84 29 20.5	+ 0.1
	32	<i>β</i> Geminorum . .	.	9	38 49.59	+ 0.28	- 22.37	10 31 48.38	+ 3 58.54	+ 10.4	7 38 27.48	. .	61 42 18.5	- 1.1
	33	Mercury C. . .	.	9	29 42.11	+ 0.14	- 22.39	18 55 50.55	+ 4 30.59	+ 19.2	8 29 19.86	- 0.03	70 7 1.5	. .
10	34	Sun I, N. . .	.	9	22 44.09	+ 0.08	- 22.40	23 13 50.72	+ 4 51.82	+ 23.9	9 22 21.77	+ 65.59	74 25 27.6	. .
	35	Sun II, S. . .	.	9	24 55.28	+ 0.08	- 22.40	23 45 53.25	+ 4 25.33	+ 24.5	9 24 32.96	- 65.60	74 57 4.3	. .
	36	<i>α</i> ² Canum Venat. . .	.	9	51 8.92	+ 0.50	- 22.31	359 63 51.42	+ 4 15.32	0.0	12 50 47.00	. .	51 4 27.9	+ 1.4
	37	<i>ε</i> Virginis . . .	.	9	56 58.74	+ 0.02	- 22.41	27 15 53.12	+ 3 33.10	+ 28.4	12 56 36.34	. .	78 26 15.8	+ 0.2
	38	Polaris, s. p. . .	.	9	19 31.89	- 39.37	- 22.42	307 33 49.42	+ 3 27.88	- 1 11.3	1 18 30.10	. .	358 42 27.2	- 0.9
	39	<i>a</i> Virginis . . .	.	9	19 40.84	- 0.25	- 22.53	49 21 55.80	+ 5 15.56	+ 1 4.2	13 19 18.17	. .	100 34 37.8	+ 0.3
13, W.	40	<i>δ</i> Canis Majoris . .	.	9	4 17.13	- 0.81	- 26.41	65 0 . .	. .	. .	7 3 49.94	. .	63 47 . .	. .
	41	<i>α</i> ² Geminorum . .	.	9	27 53.19	+ 0.27	- 26.32	6 41 59.32	+ 3 38.69	+ 6.7	7 27 27.07	. .	57 52 5.9	+ 0.1
	42	<i>a</i> Canis Minoris . .	.	9	33 52.93	- 0.26	- 26.44	33 18 1.10	+ 4 20.81	+ 37.0	7 33 26.27	. .	84 29 20.1	0.0
	43	<i>β</i> Geminorum . .	.	9	38 53.81	+ 0.18	- 26.40	10 31 56.70	+ 3 50.56	+ 10.5	7 38 27.59	. .	61 42 19.0	- 0.8
	44	Mercury II, C. .	.	9	1 55.97	- 0.03	- 26.43	20 26 0.90	+ 4 41.79	+ 20.9	9 1 29.51	- 0.19	71 37 24.8	. .
14	45	Sun I, N. . .	.	9	37 52.93	- 0.11	- 26.44	24 25 58.70	+ 5 42.98	+ 25.4	9 37 26.38	+ 65.42	75 38 28.3	. .
	46	Sun II, S. . .	.	9	40 3.77	- 0.11	- 26.44	24 58 1.78	+ 5 16.90	+ 26.0	9 39 37.22	- 65.42	76 10 5.9	. .
	47	<i>α</i> ² Canum Venat. . .	.	9	51 13.09	+ 0.46	- 26.50	359 53 56.88	+ 4 8.98	0.0	12 50 47.03	. .	51 4 27.1	+ 0.1
	48	Polaris, s. p. . .	.	5	19 50.29	- 50.22	- 26.53	307 33 55.42	+ 3 24.90	- 1 11.6	1 18 33.54	. .	358 42 29.9	+ 0.9
	49	<i>a</i> Virginis . . .	.	9	19 45.10	- 0.53	- 26.55	49 22 1.32	+ 5 10.62	+ 1 4.5	13 19 18.04	. .	100 34 37.6	+ 0.3
	50	<i>a</i> Coronæ Borealis	.	9	30 24.10	+ 0.16	- 26.65	11 43 58.30	+ 3 43.51	+ 11.6	15 29 57.62	. .	62 54 14.6	- 0.4
For summary of the constants of reduction, see page B.3														
No.	Barom.	At. Ther.	Ex. Ther.					Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						"		' "	' "	"	' "
3	30.07	84.0	86.3	8, 19, 33, 44. Four bisections.				1 to 3	+ 44.60	1	—	1.9	—	7.2
4	29.97	82.0	86.2					4 to 15	+ 47.48	2	—	1.9	—	3.4
7	30.00	85.5	87.4					16 to 23	+ 47.02	8	—	2.5	—	2.7
8	30.00	86.0	88.3					24 to 29	+ 46.90	9	—	3.3	+ 15	43.7
10	30.00	87.4	89.3					31 to 39	+ 46.60	10	—	3.4	- 15	50.4
11	29.97	89.5	92.2					41 to 50	+ 44.51	19	—	2.5	—	2.7
14	29.97	89.5	91.6							20	—	3.4	+ 15	44.1
16	29.98	82.5	84.6							21	—	3.4	- 15	51.0
19	29.98	86.8	89.8							27	—	2.4	—	2.6
20	29.97	89.0	92.5							28	—	3.4	+ 15	44.3
22	29.92	93.5	97.3							29	—	3.5	- 15	51.2
24	30.08	81.5	81.8							33	—	2.4	—	2.6
29	30.09	85.0	85.9							34	—	3.4	+ 15	44.9
30	30.07	86.5	87.0							35	—	3.5	- 15	51.8
31	30.27	74.5	76.1							44	—	2.4	—	2.5
33	30.28	76.5	77.3							45	—	3.6	+ 15	45.2
34	30.28	78.5	79.5							46	—	3.7	- 15	52.5
36	30.26	81.5	83.0											
42	30.22	70.8	72.4											
44	30.20	73.8	75.4											
46	30.20	74.6	76.2											
47	30.16	78.1	79.8											
50	30.15	75.9	76.6											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
August 14, W.	1	Moon I, N. . .	9	38	57.23	— 0.63	— 26.64	54 1 58.32	+ 3 31.42	+ 1 16.6	15 38 29.96	+69.65	105 13 7.5	. .
	2	ϵ Serpentis . . .	9	45	42.06	— 0.27	— 26.65	33 59 57.58	+ 4 0.37	+ 37.6	15 45 15.14	. .	85 10 56.8	+ 0.3
	3	ϵ Coronæ Borealis . . .	9	53	24.50	+ 0.16	— 26.58	11 38 1.32	+ 3 1.91	+ 11.5	15 52 58.01	. .	62 47 35.9	— 0.1
	4	β Scorpii . . .	9	59	24.37	— 0.68	— 26.71	58 18 0.95	+ 4 0.97	+ 1 30.2	15 58 57.03	. .	109 29 53.3	— 0.4
S.	5	γ Geminorum . . .	9	31	41.84	+ 0.05	— 27.19	22 19 54.25	+ 3 44.74	+ 23.0	6 31 14.69	. .	73 30 23.2	— 1.1
	6	ϵ Geminorum . . .	5	37	29.65	+ 0.21	— 27.23	13 34 . .	. . .	. . .	6 37 2.66	. .	64 46 . .	. .
	7	α Canis Majoris . . .	9	40	40.51	— 0.45	— 27.33	55 21 54.75	+ 4 9.49	+ 1 20.6	6 40 12.86	. .	106 33 46.0	+ 1.5
	8	α^2 Geminorum . . .	9	27	53.87	+ 0.36	— 27.07	6 41 52.18	+ 3 45.31	+ 6.6	7 27 27.01	. .	57 52 5.3	— 0.6
	9	α Canis Minoris . . .	9	33	53.70	— 0.12	— 27.33	33 17 57.60	+ 4 25.64	+ 36.4	7 33 26.35	. .	84 29 20.8	+ 0.8
15	10	β Geminorum . . .	9	38	54.47	+ 0.27	— 27.13	10 31 47.70	+ 4 0.09	+ 10.3	7 38 27.51	. .	61 42 19.3	— 0.6
	11	Sun I, N. . .	9	41	38.52	+ 0.01	— 27.28	24 45 59.30	+ 4 33.24	+ 25.3	9 41 11.25	+65.40	75 57 19.0	. .
	12	Sun II, S. . .	5	43	49.32	+ 0.01	— 27.28	25 17 57.38	+ 4 11.86	+ 25.9	9 43 22.05	—65.40	76 28 56.3	. .
	13	α^2 Canum Venat. . .	5	51	13.87	+ 0.53	— 27.36	359 54 . .	. . .	. . .	12 50 47.04	. .	51 4 . .	. .
	14	Polaris, S. P. . .	5	19	47.70	—46.21	— 27.37	307 34 . .	. . .	. . .	1 18 34.12	. .	358 42 . .	. .
W.	15	α^2 Geminorum . . .	9	27	55.40	+ 0.29	— 28.50	6 41 53.95	+ 3 43.78	+ 6.5	7 27 27.17	. .	57 52 5.4	— 0.5
	16	α Canis Minoris . . .	9	33	55.02	— 0.14	— 28.61	33 17 59.15	+ 4 24.23	+ 36.0	7 33 26.35	. .	84 29 20.6	+ 0.6
	17	β Geminorum . . .	9	38	55.89	+ 0.21	— 28.47	10 31 53.48	+ 3 54.63	+ 10.2	7 38 27.57	. .	61 42 19.5	— 0.4
	18	Sun I, N. . .	9	45	24.12	— 0.03	— 28.61	25 3 50.38	+ 5 45.73	+ 25.3	9 44 55.48	+65.18	76 16 22.6	. .
	19	Sun II, S. . .	9	47	34.49	— 0.03	— 28.61	25 35 57.22	+ 5 18.97	+ 26.0	9 47 5.85	—65.19	76 48 3.4	. .
16	20	Venus I, S. . .	6	26	44.62	— 0.06	— 28.64	27 27 59.08	+ 5 17.67	+ 28.1	10 26 15.92	+ 0.27	78 40 6.1	. .
	21	Venus II, N. . .	5	26	45.16	— 0.06	— 28.64	27 27 59.08	+ 5 7.08	+ 28.1	10 26 16.46	— 0.27	78 39 55.5	. .
	22	α^2 Canum Venat. . .	9	51	15.24	+ 0.44	— 28.66	359 53 53.40	+ 4 13.39	+ 0.0	12 50 46.95	. .	51 4 28.0	+ 0.7
	23	α Virginis . . .	9	19	47.18	— 0.35	— 28.83	49 21 58.52	+ 5 14.75	+ 1 2.7	13 19 18.08	. .	100 34 37.2	— 0.0
	24	η Ursæ Majoris . . .	9	43	35.19	+ 0.78	— 28.77	348 57 57.90	+ 3 17.17	— 10.4	13 43 7.20	. .	40 7 25.9	— 0.4
	25	η Bootis . . .	9	49	50.16	+ 0.05	— 28.76	19 51 54.98	+ 3 42.89	+ 19.5	13 49 21.44	. .	71 2 18.6	+ 0.1
	26	α^1 Herculis . . .	9	10	3.08	— 0.04	— 29.11	24 18 . .	. . .	. . .	17 9 33.94	. .	75 29 . .	. .
	27	α Ophiuchi . . .	9	30	14.91	— 0.07	— 29.09	26 9 53.28	+ 4 32.58	+ 27.0	17 29 45.74	. .	77 21 14.1	— 1.0
	28	Moon I, N. . .	9	40	6.80	— 0.52	— 29.11	59 45 55.25	+ 3 34.21	+ 1 33.7	17 39 37.17	+71.70	110 57 24.4	. .
	29	μ^1 Sagittarii . . .	9	7	35.66	— 0.51	— 29.11	59 51 56.15	+ 5 17.42	+ 1 34.4	18 7 6.04	. .	111 5 9.2	+ 0.3
	30	δ Ursæ Minoris . . .	4	8	47.75	+15.33	— 29.11	312 13 50.48	+ 3 48.01	— 1 0.1	18 8 33.97	. .	3 22 59.6	— 0.3
	31	η Serpentis . . .	9	16	2.19	— 0.28	— 29.12	41 43 54.88	+ 4 22.72	+ 49.0	18 15 32.79	. .	92 55 27.8	+ 1.0
	32	χ Draconis . . .	9	23	33.89	+ 2.58	— 29.12	326 7 57.30	+ 4 56.04	— 36.7	18 23 7.35	. .	17 18 37.8	0.0
23, S.	33	α Hydræ . . .	9	22	44.74	— 0.54	— 39.34	46 58 2.62	+ 5 4.99	+ 59.6	9 22 4.86	. .	98 10 28.4	— 0.9
	34	ϵ Leonis . . .	9	40	8.61	+ 0.09	— 39.35	14 31 54.45	+ 4 10.53	+ 14.5	9 39 29.35	. .	65 42 40.7	+ 0.4
	35	Sun I, S. . .	10	15	10.93	— 0.19	— 39.36	28 16 2.42	+ 4 44.01	+ 29.8	10 14 31.38	+64.72	79 27 37.4	. .
	36	Sun II, N. . .	9	17	20.36	— 0.19	— 39.36	27 43 56.50	+ 5 9.77	+ 29.2	10 16 40.81	—64.71	78 55 56.7	. .
	37	δ Leonis . . .	9	8	48.24	+ 0.02	— 39.41	17 39 58.02	+ 5 8.32	+ 17.6	11 8 8.88	. .	68 51 45.1	— 0.5
24	38	β Leonis . . .	9	43	0.11	— 0.11	— 39.36	23 35 55.18	+ 5 26.03	+ 24.1	11 43 20.60	. .	74 48 6.5	+ 1.1
	39	α^2 Canum Venat. . .	9	51	25.84	+ 0.50	— 39.42	359 53 54.38	+ 4 12.63	+ 0.0	12 50 46.92	. .	51 4 28.2	— 0.2
	40	Polaris, S. P. . .	6	20	14.87	—54.69	— 39.43	307 33 53.62	+ 3 27.03	— 1 11.0	1 18 40.75	. .	358 42 30.8	— 1.0
	41	α Virginis . . .	9	19	57.94	— 0.59	— 39.44	49 22 . .	. . .	. . .	13 19 17.92	. .	100 35 . .	. .
	42	α^2 Geminorum . . .	9	28	7.83	+ 0.22	— 40.63	6 41 54.42	+ 3 44.28	+ 6.7	7 27 27.38	. .	57 52 6.6	0.0
25	43	α Canis Minoris . . .	9	34	7.56	— 0.38	— 40.71	33 17 59.38	+ 4 22.25	+ 37.0	7 33 26.51	. .	84 29 19.8	+ 0.2
	44	β Geminorum . . .	9	39	8.40	+ 0.11	— 40.68	10 31 43.72	+ 4 3.98	+ 10.5	7 38 27.83	. .	61 42 19.4	— 1.1
	45	Sun I, N. . .	9	18	52.33	— 0.29	— 40.81	28 5 58.70	+ 3 53.07	+ 29.5	10 18 11.23	+64.78	79 16 42.5	. .
	46	Sun II, S. . .	9	21	1.88	— 0.29	— 40.81	28 37 59.78	+ 3 33.38	+ 30.2	10 20 20.78	—64.77	79 48 24.6	. .
	47	Venus I, S. . .	9	8	37.81	— 0.35	— 40.85	31 43 55.90	+ 3 42.91	+ 34.1	11 7 56.61	+ 0.34	82 54 34.1	. .
25	48	Venus N. . .	. . .	. . .	. . .	. . .	. . .	31 43 55.90	+ 3 32.15	+ 34.1	. . .	. . .	82 54 23.3	. .
	49	β Leonis . . .	9	44	1.69	— 0.19	— 40.86	23 35 55.98	+ 5 25.10	+ 24.1	11 43 20.62	. .	74 48 6.4	+ 0.9
	50	α^2 Canum Venat. . .	9	51	27.44	+ 0.42	— 40.95	359 53 51.82	+ 4 16.88	+ 0.0	12 50 46.93	. .	51 4 29.9	+ 1.3
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3.				Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum
	in.	°	°						"		"	"	"	"
4	30.14	74.9	75.0	19, 40.	One bisection.			1 to 4	+ 44.51	1	— 47 51.6	+16 11.1	. .	—31 40.5
5	30.15	72.	74.9					5 to 12	+ 43.66	11	— 3.7	+15 48.6	. .	+15 44.9
10	30.15	78.2	80.0		I. Three bisections.			15 to 25	+ 43.87	12	— 3.8	—15 48.6	. .	—15 52.4
12	30.15	83.	85.4					27 to 32	+ 44.32	18	— 3.7	+15 50.4	. .	+15 46.7
14	30.13	86.5	89.0	5, 9.	Four bisections.			33 to 40	+ 42.45	19	— 3.8	—15 50.4	. .	—15 54.2
15	30.17	82.3	85.7					42 to 50	+ 43.84	20	— 2.4	— 5.3	0.0	— 7.7
19	30.15	89.	91.9	28.	Five bisections.					21	— 2.4	+ 5.3	. .	+ 2.9
22	30.12	91.2	94.3							28	— 50 52.7	+16 6.6	. .	—34 46.1
25	30.12	90.7	92.3							35	— 4.2	—15 50.3	. .	—15 54.5
27	30.09	84.0	83.7							36	— 4.1	+15 50.3	. .	+15 46.2
31	30.09	82.9	82.5							45	— 4.1	+15 51.0	. .	+15 46.9
33	30.14	73.7	76.6							46	— 4.2	—15 51.0	. .	—15 55.2
36	30.15	76.0	79.2							47	— 2.8	— 5.4	0.0	— 8.2
38	30.13	79.	82.1							48	— 2.8	+ 5.4	. .	+ 2.6
41	30.10	80.4	82.6											
42	30.14	68.0	71.0											
46	30.14	76.7	80.2											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
August					m. s.	s.	s.	° / //	/ //	/ //	h. m. s.	s.	° / //	//
25, E.	1	Polaris, s. p. . .	.	10	20 18.03	-55.70	-40.95	307 33 54.00	+ 3 27.09	- 1 10.8	1 18 41.38	.	358 42 31.5	- 0.5
	2	a Virginis . . .	.	9	19 59.53	- 0.68	-40.95	49 21 53.80	+ 5 16.93	+ 1 3.8	13 19 17.90	.	100 34 35.7	- 0.9
27, S.	3	15 Argus . . .	.	4	3 31.53	- 0.89	-44.34	62 45 53.78	+ 4 44.98	+ 1 50.0	8 2 46.24	.	113 58 50.0	- 1.1
	4	a Hydræ . . .	.	7	22 49.97	- 0.60	-44.47	46 57 57.50	+ 5 8.84	+ 1 0.5	9 22 4.96	.	98 10 28.0	- 1.0
28	5	Sun I, S. . .	.	9	29 53.93	- 0.28	-44.43	29 39 51.72	+ 4 58.04	+ 32.0	10 29 9.22	+64.52	80 51 43.0	.
	6	Sun II, N. . .	.	9	32 2.98	- 0.28	-44.43	29 7 56.35	+ 5 12.68	+ 31.4	10 31 18.27	-64.53	80 20 1.6	.
	7	Venus I, N. . .	.	6	22 22.77	- 0.35	-44.44	33 11 53.18	+ 4 16.71	+ 36.7	11 21 37.98	+ 0.40	84 23 7.8	.
	8	Venus II, S. . .	.	5	22 23.56	- 0.35	-44.44	33 11 53.18	+ 4 28.20	+ 36.7	11 21 38.77	- 0.39	84 23 19.3	.
	9	β Leonis . . .	.	6	44 5.25	- 0.17	-44.44	23 35 48.50	+ 5 32.54	+ 24.5	11 43 20.64	.	74 48 6.7	+ 1.0
	10	a² Canum Venat. .	.	8	51 30.89	+ 0.41	-44.42	359 53 53.20	+ 4 15.79	0.0	12 50 46.84	.	51 4 30.2	+ 1.1
	11	Polaris, s. p. . .	.	7	20 20.52	-52.38	-44.46	307 34 . .	.	.	1 18 43.68	.	358 43 . .	.
	12	a Virginis . . .	.	9	20 3.01	- 0.64	-44.50	49 21 49.48	+ 5 20.73	+ 1 5.0	13 19 17.91	.	100 34 36.4	0.0
29, S.	13	a Hydræ . . .	.	9	22 51.74	- 0.62	-46.19	46 57 56.85	+ 5 10.78	+ 59.3	9 22 4.97	.	98 10 28.1	- 0.8
	14	a Leonis . . .	.	9	3 10.64	- 0.24	-46.12	26 17 52.68	+ 4 29.11	+ 27.3	10 2 24.24	.	77 29 10.3	+ 0.1
30	15	Sun I, S. . .	.	9	37 12.67	- 0.31	-46.16	30 23 55.70	+ 3 55.07	+ 32.4	10 36 26.20	+64.35	81 34 44.4	.
	16	Sun II, N. . .	.	9	39 21.37	- 0.31	-46.16	29 51 57.32	+ 4 10.25	+ 31.7	10 38 34.90	-64.35	81 3 0.5	.
	17	Mercury, C. . .	.	9	3 59.94	- 0.33	-46.16	31 9 54.28	+ 4 55.61	+ 33.3	11 3 13.45	0.00	82 21 44.4	.
	18	Venus I, N. . .	.	6	31 29.63	- 0.38	-46.17	34 11 51.20	+ 4 18.66	+ 37.2	11 30 43.08	+ 0.36	85 23 8.3	.
	19	Venus II, S. . .	.	5	31 30.34	- 0.38	-46.17	34 11 51.20	+ 4 28.49	+ 37.2	11 30 43.79	- 0.35	85 23 18.1	.
	20	β Leonis . . .	.	9	44 7.02	- 0.18	-46.20	23 35 51.68	+ 5 28.80	+ 23.9	11 43 20.67	.	74 48 5.6	- 0.2
	21	a² Canum Venat. .	.	9	51 32.56	+ 0.42	-46.12	359 53 51.38	+ 4 18.30	0.0	12 50 46.81	.	51 4 30.9	+ 1.5
	22	Polaris, s. p. . .	.	7	20 25.82	-54.50	-46.18	307 33 52.18	+ 3 29.94	- 1 10.5	1 18 45.14	.	358 42 32.8	- 0.6
	23	a Virginis . . .	.	9	20 4.71	- 0.66	-46.20	49 22 . .	.	.	13 19 17.87	.	100 35 . .	.
Sept.														
11, S.	24	a Leonis . . .	.	9	2 53.76	- 0.21	-29.12	26 17 57.42	+ 4 25.39	+ 27.5	10 2 24.43	.	77 29 11.5	+ 0.5
12	25	Sun I, S. . .	.	9	23 50.97	- 0.34	-29.09	35 13 58.75	+ 4 48.94	+ 39.0	11 23 21.54	+64.05	86 25 47.9	.
	26	Sun II, N. . .	.	9	25 59.08	- 0.34	-29.09	34 41 39.32	+ 5 18.38	+ 38.3	11 25 29.65	-64.06	85 53 57.2	.
	27	Mercury, C. . .	.	9	23 42.93	- 0.43	-29.01	41 11 52.00	+ 3 57.57	+ 48.1	12 23 13.49	+ 0.02	92 22 58.9	.
	28	Venus I, N. . .	.	6	29 49.77	- 0.42	-29.01	40 49 55.12	+ 4 35.63	+ 47.5	12 29 30.34	+ 0.34	92 1 39.5	.
	29	Venus II, S. . .	.	5	29 50.42	- 0.42	-29.01	40 49 55.12	+ 4 50.84	+ 47.5	12 29 20.29	- 0.31	92 1 54.7	.
	30	a² Canum Venat. .	.	4	51 15.55	+ 0.30	-29.08	359 54 . .	.	.	12 50 46.82	.	51 5 . .	.
	31	Polaris, s. p. . .	.	7	20 5.83	-44.12	-29.05	307 33 51.00	+ 3 33.10	- 1 10.8	1 18 52.66	.	358 42 34.5	- 3.1
	32	a Virginis . . .	.	8	19 47.36	- 0.54	-29.07	49 22 . .	.	.	13 19 17.77	.	100 35 . .	.
	33	η Bootis . . .	.	9	49 50.24	- 0.11	-29.00	19 51 55.05	+ 3 45.48	+ 19.8	13 49 21.06	.	71 2 21.5	+ 1.2
	34	τ Herculis . . .	.	9	16 51.26	+ 0.54	-29.20	352 13 53.45	+ 4 44.25	- 7.4	16 16 22.62	.	43 24 51.5	- 1.0
	35	a Scorpii . . .	.	9	23 3.62	- 0.77	-29.25	64 58 0.72	+ 4 38.89	+ 1 57.7	16 22 33.66	.	116 10 58.5	0.0
	36	ε Ursæ minoris .	.	9	57 47.37	+ 6.64	-29.21	316 38 . .	.	.	16 57 24.80	.	7 46 . .	.
	37	η Ophiuchi . . .	.	9	4 28.37	- 0.61	-29.18	54 24 . .	.	.	17 3 58.54	.	105 35 . .	.
	38	a¹ Herculis . . .	.	0	10 2.81	- 0.18	-29.17	24 18 . .	.	.	17 9 33.41	.	75 29 . .	.
	39	Moon I, N. . .	.	9	21 31.63	- 0.71	-29.23	59 22 1.55	+ 4 19.82	+ 1 33.5	17 21 1.69	+71.53	110 34 16.1	.
	40	β Ophiuchi . . .	.	9	38 27.24	- 0.32	-29.24	34 12 . .	.	.	17 37 57.68	.	85 23 . .	.
P.	41	a Lyncis . . .	.	9	14 43.73	+ 0.23	-30.11	3 57 52.60	+ 3 52.90	+ 3.9	9 14 13.84	.	55 8 10.6	- 1.4
	42	1 (H) Draconis .	.	9	21 22.37	+ 6.50	-30.12	317 1 53.70	+ 3 41.48	- 51.8	9 20 58.75	.	8 11 4.6	+ 0.6
	43	a Leonis . . .	.	9	2 54.80	- 0.21	-30.14	26 17 51.02	+ 4 30.84	+ 27.7	10 2 24.45	.	77 29 10.8	- 0.3
	44	γ¹ Leonis . . .	.	9	14 18.03	- 0.07	-30.14	18 23 54.50	+ 5 1.32	+ 18.7	10 13 47.82	.	69 35 35.7	+ 0.3
13	45	Sun I, N. . .	.	9	27 27.62	- 0.35	-30.17	35 5 59.90	+ 3 57.94	+ 39.4	11 26 57.10	+63.94	86 16 58.4	.
	46	Sun II, S. . .	.	9	29 35.51	- 0.35	-30.17	35 37 59.65	+ 3 47.87	+ 40.1	11 29 4.99	-63.95	86 48 48.8	.
	47	Mercury, C. . .	.	9	29 21.68	- 0.45	-30.20	41 55 56.28	+ 4 9.25	+ 50.3	12 28 51.03	+ 0.02	93 7 17.0	.
	48	Venus I, C. . .	.	9	34 21.38	- 0.44	-30.20	41 23 55.05	+ 1 30.23	+ 49.3	12 33 50.74	+ 0.35	92 32 35.8	.
	49	Polaris, s. p. . .	.	8	20 8.57	-45.57	-30.22	307 34 . .	.	.	1 18 52.78	.	358 43 . .	.
	50	η Bootis . . .	.	9	49 51.43	- 0.10	-30.21	19 52 . .	.	.	13 49 21.10	.	71 2 . .	.

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3.		Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°				//		/ //	/ //	//	/ //
2	30.12	82.0	84.5	1, 39. Three bisections.	17, 47, 48. Four bisections.	1 to 2	+ 43.84	5	- 4.3	- 15 50.7	.	- 15 55.0
3	30.11	66.5	66.0			3 to 12	+ 43.62	6	- 4.3	+ 15 50.7	.	+ 15 46.4
6	30.10	70.0	71.0			13 to 22	+ 44.34	7	- 2.9	+ 5.7	.	+ 2.8
12	30.06	73.	73.8			24 to 39	+ 45.66	8	- 2.9	- 5.8	0.0	- 8.7
13	30.01	75.5	76.7			41 to 48	+ 72.82	15	- 4.5	- 15 51.9	.	- 15 56.4
16	30.00	78.0	79.0					16	- 4.4	+ 15 51.9	.	+ 15 47.5
20	29.99	80.	83.0					17	- 3.3	.	0.0	- 3.3
23	29.97	81.5	84.3					18	- 3.0	+ 4.9	.	+ 1.9
24	30.03	72.8	74.4					19	- 3.0	- 4.9	0.0	- 7.9
26	30.02	76.0	78.7					25	- 5.1	- 15 55.3	.	- 16 0.4
33	29.99	80.5	83.3					26	- 5.0	+ 15 55.3	.	+ 15 50.3
34	29.98	77.5	78.5					27	- 4.4	.	+ 0.1	- 4.3
40	29.96	74.	74.0					28	- 3.6	+ 7.6	.	+ 4.0
41	30.01	70.5	72.1					29	- 3.6	- 7.6	.	- 11.2
43	30.02	71.0	71.3					39	- 50 40.8	+ 16 6.9	.	- 34 33.9
46	30.02	71.	71.3					45	- 5.1	+ 15 55.2	.	+ 15 50.1
47	30.03	71.0	71.2					46	- 5.1	- 15 55.2	.	- 16 0.3
50	30.03	71.5	71.7					47	- 4.5	.	+ 0.1	- 4.4
								48	- 3.6	.	+ 0.1	- 3.5

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Sept. 13, P.	1	α Bootis		9	m. s. 11 3.53	— 0.08	— 30.26	19 3 55.78	+ 3 21.97	+ 19.4	h. m. s. 14 10 33.21	.	70 13 58.4	+ 0.9
	2	Moon I, S.		10	23 20.00	— 0.80	— 30.50	61 9 56.50	+ 5 53.16	+ 1 43.5	18 22 48.70	+ 71.60	112 23 54.4	.
	3	α Lyrae		9	33 40.41	+ 0.29	— 30.58	0 8 . . .	.	.	18 33 10.19	.	51 19 . . .	.
	4	β Lyrae		9	46 28.46	+ 0.15	— 30.45	5 36 . . .	.	.	18 45 58.09	.	56 46 . . .	.
	5	51 (H) Cephei, s. p.		4	48 38.71	— 20.72	— 30.53	306 4 . . .	.	.	6 47 47.46	.	357 13 . . .	.
	6	σ Sagittarii		9	48 52.58	— 0.85	— 30.53	65 14 . . .	.	.	18 48 21.20	.	116 26 . . .	.
14 W.	7	α Leonis		9	2 55.90	— 0.22	— 31.22	26 17 53.30	+ 4 28.52	+ 28.3	10 2 24.46	.	77 29 11.3	+ 0.2
	8	Sun I, N.		9	31 4.01	— 0.38	— 31.22	35 28 1.22	+ 4 59.87	+ 40.5	11 30 32.41	+ 64.00	86 40 2.8	.
	9	Sun II, S.		9	33 12.02	— 0.38	— 3.22	35 59 56.18	+ 4 57.32	+ 41.3	11 32 40.42	— 64.01	87 11 56.0	.
	10	Mercury C.		9	34 56.78	— 0.50	— 31.22	42 40 1.38	+ 3 52.37	+ 52.1	12 34 25.06	+ 0.02	93 51 7.1	.
	11	Venus I, C.		9	38 52.71	— 0.49	— 31.22	41 51 56.08	+ 4 17.50	+ 50.6	12 38 21.00	+ 0.35	93 3 25.4	.
	12	α^2 Canum Venat.		6	51 17.50	+ 0.39	— 31.13	359 54 . . .	.	.	12 50 46.67	.	51 5 . . .	.
	13	Polaris, s. p.		9	20 14.39	— 49.97	— 31.22	307 33 55.70	+ 3 34.07	— 1 13.0	1 18 53.20	.	358 42 38.0	— 0.4
	14	η Bootis		9	49 52.46	— 0.10	— 31.24	19 51 58.55	+ 3 40.69	+ 20.4	13 49 21.14	.	71 2 20.8	+ 0.2
	15	α Bootis		9	11 4.54	— 0.08	— 31.28	19 3 58.40	+ 3 18.50	+ 19.5	14 10 33.24	.	70 13 57.6	0.0
	16	51 (H) Cephei, s. p.		8	48 42.47	— 22.83	— 31.49	306 3 54.55	+ 3 52.87	— 1 18.2	6 47 48.15	.	357 12 50.4	+ 0.2
	17	ζ Aquilæ		9	0 49.06	— 0.23	— 31.45	25 6 . . .	.	.	19 0 17.33	.	76 18 . . .	.
	18	δ Aquilæ		9	20 24.82	— 0.42	— 31.51	35 55 57.82	+ 3 12.44	+ 41.5	19 19 52.88	.	87 6 13.0	— 0.3
	19	Moon I, S.		9	24 41.28	— 0.87	— 31.52	61 3 51.92	+ 4 10.28	+ 1 43.4	19 24 8.89	+ 70.91	112 16 6.8	.
	20	γ Aquilæ		9	41 29.78	— 0.29	— 31.52	28 27 57.02	+ 4 26.20	+ 31.1	19 40 57.96	.	79 39 15.5	+ 0.1
	21	α Aquilæ		9	45 52.97	— 0.32	— 31.60	30 13 57.05	+ 4 27.91	+ 33.4	19 45 21.11	.	81 25 19.6	— 0.1
19, W.	22	ϵ Leonis		8	40 7.71	+ 0.02	— 37.96	14 31 53.45	+ 4 13.02	+ 14.7	9 39 29.79	.	65 42 42.4	— 1.1
	23	α Leonis		9	3 2.66	— 0.16	— 37.95	26 17 57.00	+ 4 25.67	+ 27.9	10 2 24.54	.	77 29 11.8	+ 0.2
	24	δ Leonis		9	8 47.06	— 0.03	— 38.01	17 39 57.42	+ 5 11.37	+ 17.9	11 8 9.01	.	68 51 47.9	— 1.0
20	25	Sun I, N.		9	52 42.39	— 0.32	— 38.07	37 47 59.05	+ 4 26.78	+ 43.2	11 52 4.00	+ 63.96	88 59 30.2	.
	26	Sun II, S.		9	54 50.32	— 0.32	— 38.07	38 20 0.42	+ 4 19.14	+ 44.1	11 54 11.93	— 63.97	89 31 24.9	.
	27	Venus I, S.		9	6 7.57	— 0.40	— 38.14	44 55 53.88	+ 3 40.36	+ 55.3	13 5 29.03	+ 0.36	96 6 50.7	.
	28	Mercury I, C.		9	7 17.87	— 0.43	— 38.14	46 51 55.35	+ 3 52.83	+ 59.2	13 6 39.30	+ 0.18	98 3 8.6	.
	29	Polaris, s. p.		4	20 14.12	— 40.32	— 38.15	307 34 . . .	.	.	1 18 55.65	.	358 43 . . .	.
	30	η Bootis		9	49 59.29	— 0.06	— 38.16	19 51 56.78	+ 3 43.67	+ 20.0	13 49 21.05	.	71 2 21.6	+ 0.3
	31	α Bootis		9	11 11.39	— 0.05	— 38.22	19 3 56.02	+ 3 23.66	+ 19.2	14 10 33.14	.	70 14 0.1	+ 1.8
21 S.	32	ϵ Leonis		9	40 8.80	— 0.02	— 38.99	14 31 53.12	+ 4 13.66	+ 14.6	9 39 29.77	.	65 42 42.6	— 1.1
	33	α Leonis		9	3 3.78	— 0.19	— 39.02	26 17 56.55	+ 4 25.46	+ 27.8	10 2 24.56	.	77 29 11.0	— 0.7
	34	δ Leonis		9	8 48.19	— 0.06	— 39.10	17 39 57.45	+ 5 12.17	+ 17.9	11 8 9.06	.	68 51 48.7	— 0.3
	35	Sun I, S.		9	56 18.91	— 0.34	— 39.10	38 43 56.65	+ 3 42.21	+ 44.9	11 55 39.47	+ 63.99	89 54 45.0	.
	36	Sun II, N.		9	58 26.90	— 0.34	— 39.10	38 11 56.25	+ 3 48.05	+ 43.9	11 57 47.46	— 64.00	89 22 49.4	.
	37	α^2 Canum Venat.		9	51 25.62	+ 0.26	— 39.14	359 53 53.25	+ 4 19.64	0.0	12 50 46.74	.	51 4 34.1	— 0.1
	38	Venus, I, S.		6	10 41.50	— 0.43	— 39.15	45 25 55.30	+ 3 46.33	+ 56.6	13 10 1.92	+ 0.36	96 36 59.4	.
	39	Venus, II, N.		5	10 42.18	— 0.43	— 39.15	45 25 55.30	+ 3 36.26	+ 56.6	13 10 2.60	— 0.32	96 36 49.4	.
	40	Mercury C.		9	12 30.71	— 0.45	— 39.15	47 32 . . .	.	.	13 11 51.11	+ 0.03	98 43 . . .	.
	41	Polaris, s. p.		6	20 13.70	— 38.50	— 39.16	307 33 54.32	+ 3 38.26	— 1 12.1	1 18 56.04	.	358 42 41.7	+ 0.9
	42	α Virginis		9	19 57.37	— 0.48	— 39.17	49 22 . . .	.	.	13 19 17.73	.	100 35 . . .	.
	43	η Bootis		9	50 0.33	— 0.10	— 39.16	19 51 56.55	+ 3 44.66	+ 20.2	13 49 21.05	.	71 2 22.6	+ 1.2
25, W.	44	ϵ Leonis		.	.	.	.	14 31 56.12	+ 4 12.02	+ 14.8	9 39.5 . . .	.	65 42 44.1	— 0.3
	45	α Leonis		9	3 9.96	— 0.34	— 44.96	26 17 59.22	+ 4 24.18	+ 28.0	10 2 24.67	.	77 29 12.6	+ 0.4
	46	δ Leonis		9	8 54.19	— 0.15	— 44.95	17 40 1.42	+ 5 9.73	+ 17.9	11 8 9.08	.	68 51 50.3	+ 0.4
26	47	Sun I, N.		9	14 24.16	— 0.62	— 44.96	40 8 2.72	+ 4 35.52	+ 47.0	12 13 38.58	+ 64.10	91 19 46.4	.
	48	Sun II, S.		9	16 32.36	— 0.62	— 44.96	40 40 2.22	+ 4 35.09	+ 47.9	12 15 46.78	— 64.10	91 51 46.4	.
	49	Polaris, s. p.		8	20 39.24	— 56.10	— 44.97	307 33 56.05	+ 3 36.61	— 1 11.8	1 18 58.17	.	358 42 42.1	— 0.5
	50	Venus I, N.		9	33 39.74	— 0.77	— 44.97	47 54 2.62	+ 4 5.57	+ 1 1.4	13 32 54.00	+ 0.37	99 5 30.8	.

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3		Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°				''		' ''	' ''	''	' ''
2	30.07	64.0	62.3	38, 39, 49.	One bisection.	1 to 2	+ 72.82	2	— 51 13.8	— 15 59.6	.	— 67 13.4
7	30.25	63.0	63.6			7 to 15	+ 70.92	8	— 5.1	+ 15 56.6	.	+ 15 51.5
9	30.24	66.5	67.8	2, 13, 16.	Three bisections.	16 to 21	+ 73.60	9	— 5.2	— 15 56.6	.	— 16 1.8
11	30.23	68.5	70.2					10	— 4.6	.	+ 0.1	— 4.5
15	30.21	69.5	71.2	10.	Four bisections.	22 to 31	+ 73.74	11	— 3.7	.	+ 0.1	— 3.6
17	30.20	64.8	62.6			32 to 43	+ 73.12	19	— 50 44.9	— 15 51.8	.	— 66 36.7
20	30.20	63.0	62.3	19.	Five bisections.	44 to 50	+ 71.40	25	— 5.4	+ 15 57.3	.	+ 15 51.9
22	30.14	67.7	69.3					26	— 5.5	— 15 57.3	.	— 16 2.8
24	30.13	72.4	74.3					27	— 3.9	— 5.4	.	— 9.3
26	30.12	73.8	75.6					28	— 5.2	.	+ 0.2	— 5.0
31	30.09	76.2	78.5					35	— 5.5	— 15 57.8	.	— 16 3.3
32	30.05	69.8	70.0					36	— 5.5	+ 15 57.8	.	+ 15 52.3
36	30.04	72.0	72.8					38	— 4.0	— 5.0	0.0	— 9.0
43	30.03	73.7	74.1					39	— 4.0	+ 5.0	.	+ 1.0
44	29.70	57.4	58.3					47	— 5.7	+ 16 0.0	.	+ 15 54.3
46	29.69	62.9	64.6					48	— 5.8	— 16 0.0	.	— 16 5.8
48	29.68	65.5	67.9					50	— 4.1	+ 5.5	.	+ 1.4

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD		CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
					Inst.	Clock	Instrument	Refraction							
Sept. 26, W.	1	Venus S.	.	.	m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"	
	2	η Bootis	.	5	50 6.21	— 0.20	— 44.97	19 52 .	. . .	. . .	13 49 21.04	. .	61 2 .	. .	
October 3, S.	3	δ Leonis	.	9	8 59.99	— 0.13	— 50.65	17 40 2.45	+ 5 9.89	+ 18.6	11 8 9.16	. .	68 51 52.1	+ 0.9	
	4	β Leonis	.	9	44 11.84	— 0.28	— 50.74	23 36 4.15	+ 5 19.39	+ 25.5	11 43 20.87	. .	74 48 10.2	+ 0.4	
	5	Polaris, s. p. . . .	.	6	20 52.69	— 62.27	— 50.64	307 33 55.18	+ 3 43.26	— 1 14.6	1 18 59.78	. .	358 42 45.0	— 0.7	
	6	Venus I, N.	.	6	11 0.02	— 0.93	— 50.62	51 40 2.40	+ 4 57.36	+ 1 12.7	14 10 8.47	+ 0.40	102 52 33.7	. .	
	7	Venus II, S.	.	5	11 0.76	— 0.93	— 50.62	51 40 2.40	+ 5 9.32	+ 1 12.7	14 10 9.21	— 0.34	102 52 45.6	. .	
	8	Mercury C.	.	9	15 0.81	— 1.01	— 50.62	54 57 59.80	+ 4 31.66	+ 1 21.9	14 14 9.18	+ 0.06	106 10 14.6	. .	
	9	ρ Bootis	.	9	27 50.28	+ 0.15	— 50.51	7 57 59.92	+ 3 36.75	+ 8.1	14 26 59.82	. .	59 8 6.0	— 0.2	
	10	β Bootis	.	9	58 33.17	+ 0.51	— 50.61	357 59 56.32	+ 3 37.52	— 1.9	14 57 43.08	. .	49 9 53.1	— 0.9	
	11	α Coronæ Borealis	.	9	30 47.29	+ 0.03	— 50.60	11 43 59.08	+ 3 46.36	+ 11.9	15 29 56.74	. .	62 54 18.5	— 0.3	
	12	α Serpentis	.	9	39 36.54	— 0.48	— 50.65	32 1 59.72	+ 4 13.65	+ 35.8	15 38 45.48	. .	83 13 10.4	0.0	
9, S.	13	δ Leonis	.	9	9 2.58	— 0.17	— 53.10	17 39 56.40	+ 5 14.45	+ 18.7	11 8 9.23	. .	68 51 50.7	— 1.6	
	14	β Leonis	.	9	44 14.43	— 0.32	— 53.20	23 35 57.50	+ 5 27.12	+ 25.5	11 43 20.93	. .	74 48 11.3	+ 0.5	
	15	α² Canum Venat. . .	.	9	51 39.60	+ 0.40	— 53.22	359 54 .	. . .	. . .	12 50 46.84	. .	51 5 .	. .	
10	16	Sun I, S.	.	9	5 30.78	— 0.84	— 53.16	46 3 58.00	+ 4 26.50	+ 1 0.0	13 4 36.78	+ 64.95	97 15 45.7	. .	
	17	Sun II, N.	.	9	7 40.68	— 0.84	— 53.16	45 31 59.08	+ 4 20.73	+ 58.9	13 6 46.68	— 64.95	96 43 39.9	. .	
	18	Polaris, s. p. . . .	.	8	20 57.05	— 62.66	— 53.16	307 33 58.52	+ 3 43.00	— 1 14.7	1 19 1.23	. .	358 42 48.0	+ 0.1	
	19	Mercury C.	.	10	38 34.78	— 1.11	— 53.14	57 23 55.90	+ 3 36.14	+ 1 29.8	14 37 40.53	+ 0.08	108 35 23.0	. .	
	20	Venus I, C.	.	6	39 39.08	— 1.04	— 53.14	54 17 58.12	+ 5 3.59	+ 1 20.0	14 38 44.90	+ 0.30	105 30 42.9	. .	
	21	Venus II	.	5	39 39.64	— 1.04	— 53.14	54 18 .	. . .	. . .	14 38 45.46	— 0.26	. . .	. .	
	22	α Coronæ Borealis	.	9	30 49.76	0.00	— 53.10	11 43 52.95	+ 3 53.57	+ 12.0	15 29 50.63	. .	62 54 19.7	— 0.1	
	23	α Serpentis	.	9	39 39.04	— 0.52	— 53.17	32 1 54.55	+ 4 19.01	+ 35.9	15 38 45.39	. .	83 13 10.7	— 0.2	
	24	η Herculis	.	9	39 55.89	+ 0.41	— 53.13	359 41 55.22	+ 3 20.58	— 0.2	16 39 3.18	. .	50 51 36.8	+ 0.5	
	25	κ Ophiuchi	.	9	53 16.13	— 0.46	— 53.14	29 15 59.48	+ 3 57.21	+ 32.2	16 52 22.55	. .	80 26 50.1	+ 0.3	
	26	α Ophiuchi	.	9	30 38.29	— 0.39	— 53.12	26 9 55.75	+ 4 30.58	+ 28.3	17 29 44.79	. .	77 21 15.8	+ 0.9	
	27	μ Herculis	.	9	42 58.04	+ 0.02	— 53.06	11 1 56.58	+ 4 1.61	+ 11.3	17 42 4.95	. .	62 12 30.7	— 0.5	
	28	Moon I	.	9	4 3.34	— 1.23	— 53.10	60 54 .	. . .	. . .	18 3 9.01	+ 72.50	111 16 .	. .	
16, W.	29	δ Leonis	.	9	9 3.93	— 0.09	— 54.40	17 40 2.05	+ 5 11.12	+ 18.4	11 8 9.45	. .	68 51 52.8	— 0.9	
	30	β Leonis	.	9	44 15.64	— 0.24	— 54.39	23 36 1.38	+ 5 24.85	+ 25.2	11 43 21.00	. .	74 48 12.6	+ 0.7	
	31	γ Ursæ Majoris . . .	.	9	48 48.96	+ 1.26	— 54.40	344 30 1.90	+ 5 3.14	— 15.8	11 47 55.82	. .	35 41 10.4	+ 0.2	
	32	κ Draconis	.	7	29 30.64	+ 3.20	— 54.40	328 26 .	. . .	. . .	12 28 39.44	. .	19 36 .	. .	
17	33	Sun I, N.	.	9	31 32.80	— 0.81	— 54.41	48 7 56.10	+ 4 18.79	+ 1 3.9	13 30 37.58	+ 65.38	99 19 40.0	. .	
	34	Sun II, S.	.	9	33 43.57	— 0.81	— 54.41	48 39 59.80	+ 4 24.16	+ 1 5.1	13 32 48.35	— 65.39	99 51 50.3	. .	
	35	12 Ceti	.	9	25 17.38	— 0.82	— 54.61	43 23 55.62	+ 3 6.37	+ 55.7	0 24 22.05	. .	94 34 18.9	+ 0.2	
	36	Moon I, S.	.	9	28 52.99	— 0.80	— 54.51	41 37 53.95	+ 4 27.76	+ 52.4	0 27 57.68	+ 62.10	92 49 35.3	. .	
	37	β Ceti	.	9	38 56.38	— 1.13	— 54.59	57 23 58.38	+ 4 0.98	+ 1 32.0	0 38 0.74	. .	108 35 52.6	+ 0.7	
	38	ε Piscium	.	9	58 5.54	— 0.57	— 54.43	31 31 55.20	+ 3 39.07	+ 36.2	0 57 10.45	. .	82 42 31.7	+ 0.7	
	39	β Andromedæ	.	9	4 25.27	+ 0.14	— 54.43	3 48 .	. . .	. . .	1 3 30.89	. .	54 58 .	. .	
	40	Polaris	.	8	18 57.46	+ 55.82	— 54.52	310 8 .	. . .	. . .	1 18 58.76	. .	1 17 .	. .	
	41	Polyhymnia	10.	9	59 34.70	— 0.31	— 54.54	20 7 53.48	+ 5 12.64	+ 21.8	2 58 39.85	. .	71 19 49.1	— 2.6	
	42	α Orionis	.	9	50 3.71	— 0.46	— 54.60	31 25 57.50	+ 3 56.47	+ 36.5	5 49 8.67	. .	82 36 51.7	+ 0.9	
	43	ν Orionis	.	9	2 7.68	— 0.28	— 54.52	24 1 55.68	+ 4 25.75	+ 26.7	6 1 12.82	. .	75 13 9.3	— 0.2	
	44	Weisse 256	8.5	8	12 7.50	— 0.49	— 54.59	32 41 54.58	+ 3 47.27	+ 38.4	6 11 12.42	— 2.02	83 52 41.4	+ 1.5	
	45	Comet 1889, I . . .	.	9	13 7.99	— 0.49	— 54.59	32 41 54.58	+ 5 22.36	+ 38.4	6 12 12.91	. .	83 54 16.5	. .	
	46	Lalande 12048 . . .	8.	9	14 1.31	— 0.49	— 54.59	32 42 .	. . .	. . .	6 13 6.23	— 2.01	83 52 .	. .	
	47	γ Geminorum	.	9	32 11.44	— 0.24	— 54.65	22 19 54.85	+ 3 43.50	+ 24.6	6 31 16.61	. .	73 30 24.2	— 0.3	
	48	51 (H) Cephei . . .	.	3	48 34.25	+ 26.96	— 54.59	311 37 51.75	+ 4 4.77	— 1 7.0	6 48 6.62	. .	2 47 10.7	+ 0.1	
	49	Weisse 1437	.	9	49 59.18	— 0.40	— 54.59	29 1 56.78	+ 3 44.03	+ 33.3	6 49 4.19	— 1.86	80 12 35.3	— 1.3	
	50	Bonn VI + 10°, 1335	.	9	51 12.83	— 0.39	— 54.60	28 41 56.88	+ 5 9.48	+ 32.8	6 50 17.84	— 1.86	79 54 0.4	— 1.5	

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3		Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum
	in.	°	°				"		' "	' "	"	' "
2	29.67	68.5	71.5	44, 50.	One bisection.	1	+ 71.40	1	— 4.1	— 5.5	+ 0.1	— 9.5
3	30.17	52.2	53.8				+ 69.10	6	— 4.5	+ 6.0	.	+ 1.5
5	30.12	57.0	58.1	36, 41.	Three bisections.	3 to 12	+ 69.11	7	— 4.5	— 6.0	+ 0.1	— 10.4
12	30.06	60.0	61.2	45.	Four bisections.	13 to 27	+ 71.13	8	— 6.8	. .	+ 0.4	— 6.4
13	30.01	49.0	49.0			29 to 34	+ 71.82	16	— 6.4	— 16 2.9	.	— 16 9.3
17	30.00	53.5	54.9			35 to 50		17	— 6.3	+ 16 2.9	.	+ 15 56.6
22	29.97	57.8	58.2					19	— 7.6	. .	+ 0.5	— 7.1
28	29.96	55.8	56.0					20	— 4.8	. .	+ 0.1	— 4.7
29	30.02	56.3	57.3					33	— 6.6	+ 16 5.1	.	+ 15 58.5
34	30.02	59.5	60.0					34	— 6.7	— 16 5.1	.	— 16 11.8
36	30.15	49.8	48.0					36	— 36 26.3	— 15 1.4	.	— 51 27.7
40	30.16	49.3	46.8	2. Barometer and thermometers read at 14 ^h 26 ^m .								
41	30.17	47.7	45.6									
45	30.18	44.0	41.4									

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
October					m. s.	s.	s.	° / //	/ //	/ //	h. m. s.	s.	° / //	//
17, W.	1	ϵ Canis Majoris . . .	.	9	55 10.86	— 1.34	— 54.58	67 35 59.30	+ 4 16.50	+ 2 24.6	6 54 14.92	.	118 49 1.6	— 1.9
28, S.	2	β Corvi	.	8	28 29.42	— 1.12	+ 2.42	61 34 . . .	.	.	12 28 30.75	.	112 47 . . .	.
	3	α^2 Canum Venat. . .	.	9	50 44.10	+ 0.39	+ 2.53	359 53 55.52	+ 4 27.66	0.0	12 50 46.96	.	51 4 44.4	— 0.7
	4	Polaris, s. p. . . .	.	8	19 55.19	— 58.78	+ 2.49	307 33 50.15	+ 3 58.00	— 1 15.1	1 18 58.90	.	358 42 54.3	— 0.9
	5	α Virginis	.	7	19 16.29	— 0.84	+ 2.45	49 22 . . .	.	.	13 19 17.94	.	100 35 . . .	.
29	6	Sun I, N.	.	9	16 23.37	— 0.91	+ 2.53	52 18 1.28	+ 4 18.15	+ 1 14.7	14 16 24.99	+66.69	103 29 55.3	.
	7	Sun II, S.	.	9	18 36.76	— 0.91	+ 2.53	52 49 59.02	+ 4 35.35	+ 1 16.1	14 18 38.38	—66.70	104 2 11.7	.
	8	α Coronæ Borealis . .	.	9	29 53.88	+ 0.02	+ 2.63	11 43 51.95	+ 3 58.75	+ 12.0	15 29 56.48	.	62 54 23.9	— 0.1
	9	α Serpentis	.	9	38 43.14	— 0.47	+ 2.59	32 1 57.18	+ 4 20.28	+ 36.0	15 38 45.25	.	83 13 14.7	+ 1.5
	10	β Scorpii	.	9	58 54.47	— 1.04	+ 2.54	58 17 56.98	+ 4 1.04	+ 1 32.6	15 58 56.03	.	109 29 51.8	+ 0.3
	11	α Andromedæ	.	9	2 36.09	+ 0.01	+ 2.62	10 19 55.40	+ 4 52.25	+ 10.7	0 2 38.72	.	61 31 19.6	+ 0.1
	12	γ Pegasi	.	9	7 28.52	— 0.34	+ 2.57	24 13 54.85	+ 5 20.36	+ 26.4	0 7 30.80	.	75 26 2.8	+ 0.8
	13	δ Ceti	.	5	24 20.08	— 0.75	+ 2.60	43 24 . . .	.	.	0 24 21.94	.	94 34 . . .	.
	14	β Andromedæ	.	9	3 28.13	+ 0.20	+ 2.66	3 47 53.35	+ 3 48.07	+ 3.9	1 3 30.92	.	54 58 6.5	0.0
	15	Polaris	.	8	18 0.47	+ 55.70	+ 2.58	310 8 . . .	.	.	1 18 58.75	.	1 17 . . .	.
	16	α Arietis	.	9	0 52.28	— 0.14	+ 2.60	15 54 . . .	.	.	2 0 54.70	.	67 4 . . .	.
	17	Iris	.	9	18 22.21	— 0.16	+ 2.55	16 35 52.78	+ 5 32.20	+ 17.6	2 18 24.60	.	67 48 3.8	— 3.0
	18	γ Ceti	.	9	37 30.69	— 0.60	+ 2.55	36 1 58.72	+ 4 56.60	+ 42.9	2 37 32.63	.	87 13 59.4	— 1.1
	19	Polyhymnia	.	9	47 58.19	— 0.26	+ 2.53	20 37 56.15	+ 6 2.19	+ 22.3	2 48 0.46	.	71 50 41.8	— 2.6
	20	α Ceti	.	9	56 26.42	— 0.58	+ 2.47	35 9 53.12	+ 3 54.14	+ 41.6	2 56 28.37	.	86 20 50.1	+ 0.1
30, P.	21	Polaris	.	6	18 1.60	+ 56.06	+ 2.67	310 8 . . .	.	.	1 19 0.33	.	1 17 . . .	.
	22	β Trianguli	.	9	2 53.56	+ 0.24	+ 2.47	4 22 . . .	.	.	2 2 56.24	.	55 32 . . .	.
	23	Harmonia	.	9	8 21.22	— 0.49	+ 2.41	32 56 . . .	.	.	2 8 23.14	.	84 7 . . .	.
	24	Iris	.	9	17 33.97	— 0.11	+ 2.36	16 46 . . .	.	.	2 17 36.22	.	67 57 . . .	.
	25	ξ^2 Ceti	.	9	22 13.30	— 0.44	+ 2.31	30 52 . . .	.	.	2 22 15.20	.	82 2 . . .	.
	26	δ Ceti	.	9	33 45.64	— 0.62	+ 2.31	38 58 . . .	.	.	2 33 47.30	.	90 9 . . .	.
	27	γ^2 Ceti	.	9	37 30.98	— 0.55	+ 2.22	36 2 . . .	.	.	2 37 32.69	.	87 14 . . .	.
	28	Polyhymnia	10.	9	47 1.39	— 0.21	+ 2.21	20 46 . . .	.	.	2 47 3.39	.	71 52 . . .	.
E.	29	Moon II	.	9	36 28.09	— 0.54	+ 2.42	32 6 . . .	.	.	11 36 29.97	—67.43	82 45 . . .	.
	30	β Leonis	.	9	43 19.24	— 0.33	+ 2.38	23 35 54.92	+ 5 31.82	+ 26.1	11 43 21.33	.	74 48 14.0	— 0.6
	31	α^2 Canum Venat. . .	.	9	50 44.21	+ 0.36	+ 2.49	359 53 58.32	+ 4 26.30	0.0	12 50 47.02	.	51 4 45.8	0.0
	32	Polaris, s. p. . . .	.	7	19 58.82	— 60.62	+ 2.46	307 33 56.08	+ 3 53.19	— 1 15.8	1 19 0.66	.	358 42 54.7	— 1.3
31	33	Sun I, N.	.	9	24 11.97	— 1.00	+ 2.48	52 58 0.82	+ 3 15.68	+ 1 16.7	14 24 13.45	+66.95	104 8 54.4	.
	34	Sun II, S.	.	9	26 25.87	— 1.00	+ 2.48	53 29 56.12	+ 3 36.49	+ 1 18.2	14 26 27.35	—66.95	104 41 12.0	.
	35	δ Bootis	.	9	10 56.10	+ 0.18	+ 2.54	5 5 54.18	+ 3 38.15	+ 5.2	15 10 58.77	.	56 15 58.7	+ 0.6
	36	μ^1 Bootis	.	9	20 12.18	+ 0.32	+ 2.46	1 3 57.18	+ 3 24.26	+ 1.1	15 20 15.00	.	52 13 43.7	+ 0.4
	37	α Coronæ Borealis . .	.	9	29 54.02	— 0.02	+ 2.53	11 43 59.02	+ 3 51.27	+ 12.0	15 29 56.50	.	62 54 23.5	— 1.1
	38	α Serpentis	.	9	38 43.27	— 0.53	+ 2.52	32 1 55.72	+ 4 21.39	+ 36.1	15 38 45.25	.	83 13 14.4	+ 0.9
	39	Venus I, C.	.	9	24 21.59	— 1.19	+ 2.52	61 25 58.92	+ 3 52.65	+ 1 45.3	16 24 22.92	+ 0.44	112 37 58.1	.
	40	β Herculis	.	3	25 21.95	— 0.17	+ 2.51	17 4 . . .	.	.	16 25 24.30	.	68 16 . . .	.
	41	η Herculis	.	7	38 59.98	+ 0.37	+ 2.49	359 41 55.88	+ 3 24.98	— 0.2	16 39 2.88	.	50 51 41.9	+ 1.0
	42	δ Ceti	.	9	24 20.36	— 0.79	+ 2.35	43 24 2.20	+ 3 0.89	+ 55.4	0 24 21.94	.	94 34 19.7	+ 0.3
	43	π Andromedæ	.	9	30 54.48	+ 0.14	+ 2.36	5 43 58.35	+ 3 4.11	+ 5.9	0 30 56.99	.	56 53 29.6	— 0.5
	44	μ Andromedæ	.	9	50 32.87	+ 0.31	+ 2.32	0 56 1.72	+ 3 45.28	+ 1.0	0 50 35.54	.	52 6 9.2	— 0.9
	45	ϵ Piscium	.	9	57 8.72	— 0.53	+ 2.36	31 31 56.32	+ 3 37.78	+ 36.0	0 57 10.55	.	82 42 31.3	+ 0.4
	46	β Andromedæ	.	9	3 28.34	+ 0.21	+ 2.44	3 47 57.20	+ 3 43.92	+ 3.9	1 3 30.91	.	54 58 6.2	0.0
	47	Polaris	.	9	17 59.65	+ 58.54	+ 2.35	310 7 58.30	+ 3 54.14	— 1 9.2	1 19 0.54	.	1 17 4.4	+ 0.5
	48	β Arietis	.	9	48 28.07	— 0.22	+ 2.39	18 33 57.20	+ 3 29.97	+ 19.8	1 48 30.19	.	69 44 8.2	— 0.6
	49	γ Andromedæ	.	9	57 2.43	+ 0.46	+ 2.34	357 1 55.18	+ 4 2.14	— 3.0	1 57 5.23	.	48 12 15.5	+ 0.3
	50	Harmonia	.	9	7 20.77	— 0.56	+ 2.34	32 58 0.88	+ 5 38.23	+ 38.2	2 7 22.55	.	84 10 38.5	— 4.0
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						//		/ //	/ //	//	/ //
1	30.19	43.7	40.7	I. One bisection.				I	+ 71.82	6	— 7.1	+16 8.2	.	+16 1.1
3	30.05	51.6	52.2	32, 47. Three bisections.				3 to 10	+ 71.46	7	— 7.1	—16 8.2	.	—16 15.3
7	30.01	53.0	55.5	39. Four bisections.				11 to 20	+ 72.04	33	— 7.1	+16 8.8	.	+16 1.7
10	29.96	57.5	58.4					30 to 41	+ 70.18	34	— 7.2	—16 8.8	.	—16 16.0
12	29.93	49.5	47.5					42 to 50	+ 68.99	39	— 5.5	.	+ 0.1	— 5.4
15	29.94	48.2	46.3											
20	29.99	46.8	44.2											
28	30.30	43.0	39.2											
29	30.36	45.5	45.5											
34	30.32	56.5	59.2											
41	30.30	62.0	63.0											
42	30.32	54.5	53.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction	
						Inst.	Clock		Instrument	Refraction					
October 31, E.	1	67 Ceti	9	9	m. s. 11 25.09	s. 0.84	+	2.29	45 43 52.22	+ 4 53.80	+ 1 0.3	2 11 26.59	. .	96 56 7.5	0.0
	2	Iris	9	9	16 45.69	0.18	+	2.33	16 53 58.02	+ 3 56.63	+ 17.9	2 16 47.84	. .	68 4 33.7	- 3.0
	3	ξ ² Ceti	9	9	22 13.38	0.51	+	2.30	30 51 56.62	+ 3 27.38	+ 35.1	2 22 15.20	. .	82 2 20.3	- 0.2
	4	δ Ceti	9	9	33 45.61	0.69	+	2.42	38 58 0.18	+ 3 59.41	+ 47.5	2 33 47.25	. .	90 9 8.3	+ 1.0
	5	γ ² Ceti	9	9	37 31.02	0.63	+	2.27	36 2 1.32	+ 4 55.01	+ 42.8	2 37 32.72	. .	87 14 0.3	- 0.3
	6	Polyhymnia	9.5	9	46 4.54	0.28	+	2.32	20 43 58.25	+ 6 17.97	+ 22.3	2 46 6.58	. .	71 56 59.7	- 2.6
Nov. 1, S.	7	α Piscis Australis	9	9	51 29.00	1.37	+	2.28	69 1 57.60	+ 1 59.68	+ 2 30.7	22 51 29.98	. .	120 12 49.2	+ 0.3
	8	α Pegasi	9	9	59 11.20	0.34	+	2.33	24 11 57.22	+ 4 45.11	+ 26.2	22 59 13.21	. .	75 23 29.7	+ 0.3
	9	ε Piscium	9	9	57 8.71	0.50	+	2.34	31 31 55.88	+ 3 38.60	+ 35.9	0 57 10.53	. .	82 42 31.6	+ 0.7
	10	β Andromedæ	9	9	3 28.38	0.22	+	2.39	3 47 52.95	+ 3 47.30	+ 3.9	1 3 30.92	. .	54 58 5.3	- 0.8
	11	Polaris	8	8	17 59.01	+58.20	+	2.32	310 7 49.38	+ 4 1.11	- 1 8.9	1 18 59.53	. .	1 17 2.8	- 0.7
	12	ο Piscium	9	9	39 29.76	0.47	+	2.34	30 13 54.80	+ 3 18.57	+ 34.1	1 39 31.61	. .	81 24 8.7	+ 0.1
	13	β Arietis	9	9	48 28 13	0.20	+	2.31	18 33 54.85	+ 3 32.71	+ 19.7	1 48 30.24	. .	69 44 8.5	- 0.2
	14	α Arietis	9	9	0 52.60	0.13	+	2.29	15 53 55.65	+ 3 16.57	+ 16.7	2 0 54.78	. .	67 3 50.1	+ 0.8
	15	Harmonia	9	9	6 21.04	0.54	+	2.31	33 1 57.52	+ 4 57.91	+ 38.0	2 6 22.81	. .	84 13 54.6	- 4.0
	16	Iris	9	9	15 57.63	0.16	+	2.31	17 1 56.78	+ 4 26.89	+ 17.9	2 15 59.78	. .	68 13 2.8	- 3.0
	17	ξ ² Ceti	9	9	22 13.37	0.49	+	2.30	30 51 57.92	+ 3 26.36	+ 34.9	2 22 15.19	. .	82 2 20.4	- 0.1
	18	γ ² Ceti	9	9	37 30.96	0.60	+	2.31	36 1 53.38	+ 5 3.46	+ 42.5	2 37 32.66	. .	87 14 0.5	- 0.2
	19	Polyhymnia	9	9	45 7.58	0.26	+	2.30	20 47 56.58	+ 5 34.24	+ 22.3	2 45 9.62	. .	72 0 14.3	- 2.6
5, W.	20	α ² Canum Venat.	9	9	50 45.99	+ 0.30	+	0.88	359 54 2.58	+ 4 22.38	0.0	12 50 47.17	. .	51 4 46.2	- 1.4
6	21	Polaris, S. P.	5	5	19 54.34	-56.35	+	0.87	307 34 . . .	. . .	. . .	1 18 58.86	. .	1 17 . . .	. . .
	22	Sun I, N.	9	9	47 58.76	-0.95	+	0.86	54 47 56.05	+ 4 27.31	+ 1 19.5	14 47 58.67	+67.53	106 0 4.1	. . .
	23	Sun II, S.	9	9	50 13.82	-0.95	+	0.86	55 19 55.72	+ 4 48.17	+ 1 21.1	14 50 13.73	-67.53	106 32 26.2	. . .
	24	κ Ophiuchi	9	9	52 21.86	- 0.45	+	0.85	29 16 0.55	+ 4 0.79	+ 31.2	16 52 22.24	. .	80 26 53.7	+ 0.7
	25	Venus I, N.	7	7	56 5.82	- 1.11	+	0.83	62 39 58.20	+ 4 58.33	+ 1 47.4	16 56 5.54	+ 0.45	113 53 5.1	. . .
	26	Venus S.	. . .	. . .	. . .	. . .	. . .	. . .	62 39 58.20	+ 5 11.74	+ 1 47.4	. . .	. . .	113 53 18.5	. . .
	27	η Ophiuchi	9	9	3 58.04	- 0.94	+	0.75	54 24 0.58	+ 3 23.58	+ 1 17.6	17 3 57.93	. .	105 35 3.0	- 0.3
	28	α ¹ Herculis	9	9	9 32.16	- 0.34	+	0.82	24 17 59.48	+ 3 57.69	+ 25.2	17 9 32.65	. .	75 28 43.6	0.0
	29	α Ophiuchi	9	9	29 44.02	- 0.39	+	0.81	26 9 56.20	+ 4 34.10	+ 27.4	17 29 44.46	. .	77 21 18.9	+ 0.9
	30	Moon I	9	9	36 4.93	- 1.08	+	0.82	59 42 . . .	. . .	. . .	17 36 4.67	+74.03	110 53 . . .	. . .
	31	μ Herculis	9	9	42 3.69	- 0.04	+	0.91	11 1 56.82	+ 4 6.38	+ 10.9	17 42 4.47	. .	62 12 35.3	+ 0.1
10, W.	32	Polaris	5	5	18 20.20	+37.77	-	0.69	310 8 . . .	. . .	. . .	1 18 57.28	. .	1 17 . . .	. . .
	33	ο Piscium	9	9	39 32.52	- 0.21	-	0.67	30 13 53.05	+ 3 21.19	+ 33.6	1 39 31.61	. .	81 24 9.0	+ 0.4
	34	β Arietis	9	9	48 31.03	- 0.03	-	0.73	18 33 53.38	+ 3 34.55	+ 19.4	1 48 30.30	. .	69 44 8.5	+ 0.4
	35	Harmonia	9	9	58 0.54	- 0.25	-	0.70	33 25 57.58	+ 3 48.83	+ 38.1	1 57 59.59	. .	84 36 45.7	- 4.0
	36	Iris	7	9	9 19.47	- 0.03	-	0.70	18 23 50.92	+ 3 2.40	+ 19.2	2 9 18.74	. .	69 33 33.7	- 3.2
	37	ξ ² Ceti	9	9	22 16.11	- 0.22	-	0.65	30 51 55.45	+ 3 29.39	+ 34.6	2 22 15.19	. .	82 2 20.6	0.0
	38	Polyhymnia	9.5	9	36 51.92	- 0.08	-	0.70	21 19 53.22	+ 4 4.32	+ 22.6	2 36 51.14	. .	72 30 41.3	- 2.6
	39	α Ceti	9	9	56 29.44	- 0.28	-	0.74	35 9 51.90	+ 3 56.41	+ 40.8	2 56 28.46	. .	86 20 50.3	- 0.3
	40	ε Eridani	9	9	27 43.12	- 0.46	-	0.70	48 37 56.60	+ 4 43.46	+ 1 5.9	3 27 41.96	. .	99 50 7.2	+ 0.1
	41	γ Tauri	9	9	13 29.13	- 0.11	-	0.68	23 27 56.92	+ 3 47.20	+ 25.3	4 13 28.31	. .	74 38 30.6	- 1.0
	42	ε Tauri	. . .	. . .	. . .	. . .	. . .	. . .	19 53 54.75	+ 3 25.23	+ 21.1	4 22.1 . . .	. .	71 4 2.3	- 1.1
	43	α Tauri	9	9	29 33.62	- 0.10	-	0.74	22 31 55.55	+ 4 15.71	+ 24.2	4 29 32.81	. .	73 42 56.7	+ 0.5
	44	Comet 1889, I	9	9	34 36.80	- 0.33	-	0.71	38 57 59.02	+ 6 2.48	+ 47.0	4 34 35.76	. .	90 11 9.7	. . .
	45	ι Aurigæ	9	9	49 46.07	+ 0.20	-	0.71	5 49 54.50	+ 4 23.02	+ 6.0	4 49 45.56	. .	57 0 44.7	+ 1.0
11, E.	46	74 Cygni	9	9	32 29.53	- 0.33	-	0.81	358 53 45.22	+ 4 49.07	- 1.1	21 32 29.03	. .	50 4 54.4	- 0.6
	47	ε Pegasi	9	9	38 43.84	- 0.23	-	0.85	29 28 1.60	+ 3 1.25	+ 33.4	21 38 42.78	. .	80 37 57.4	- 0.9
	48	16 Pegasi	9	9	48 0.36	+ 0.03	-	0.78	13 25 51.35	+ 3 14.91	+ 14.2	21 47 59.56	. .	64 35 41.7	+ 0.1
	49	θ Aquarii	9	9	10 58.63	- 0.49	-	0.87	47 7 55.38	+ 4 52.68	+ 1 3.8	22 10 57.30	. .	98 20 13.1	- 0.1
	50	γ Aquarii	9	9	15 55.38	- 0.40	-	0.85	40 45 58.50	+ 3 39.00	+ 51.1	22 15 54.14	. .	91 56 49.8	0.0
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3				Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum	
	in.	°	°						//		' //	' //	//	' //	
6	30.29	52.5	51.3	33, 42.	One bisection.			1 to 6	+ 68.99	22	- 7.3	+16 11.0	.	+16	3.7
7	30.28	57.8	56.1	44.	Four bisections.			7 to 19	+ 69.13	23	- 7.4	-16 11.0	.	-16	18.4
9	30.27	56.0	53.8					20 to 31	+ 68.78	25	- 5.6	+ 6.7	.	+	1.1
15	30.26	55.8	53.8					33 to 45	+ 73.03	26	- 5.6	- 6.7	0.0	-	12.3
19	30.25	55.5	53.9					46 to 50	+ 71.72						
20	30.02	63.0	63.4												
23	29.98	66.2	69.0												
26	29.94	70.7	72.7												
31	29.93	71.5	72.7												
33	29.69	52.7	50.5												
41	29.71	49.3	46.8												
45	29.72	50.0	48.2												
46	30.10	47.5	45.5												

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Nov. 11, E.	1	η Aquarii		9	m. s. 29 39.26	— 0.38	— 0.87	39 29 53.28	+ 4 20.42	+ 48.9	h. m. s. 22 29 38.04	.	90 41 24.8	+ 0.5
	2	Moon I, S.		9	35 31.57	— 0.57	— 0.84	52 15 58.40	+ 4 38.14	+ 1 16.6	22 35 30.16	+ 65.25	103 28 14.3	.
	3	ϵ Cephei		9	45 43.61	+ 1.51	— 0.85	333 13 53.08	+ 3 5.28	— 29.8	22 45 44.27	.	24 22 49.8	+ 1.0
	4	λ Aquarii		6	46 49.69	— 0.49	— 0.85	46 57 54.95	+ 4 58.59	+ 1 3.6	22 46 48.35	.	98 10 18.3	+ 0.8
	5	α Andromedæ		9	56 48.84	+ 0.38	— 0.82	357 5 54.30	+ 3 54.01	— 2.9	22 56 48.37	.	48 16 6.6	+ 0.3
12, W.	6	Moon I, S.		9	25 33.91	— 0.70	— 0.75	47 55 59.88	+ 2 26.42	+ 1 6.0	23 25 32.46	+ 63.48	99 5 53.5	.
	7	ϵ Piscium		9	34 14.87	— 0.46	— 0.71	33 48 2.12	+ 3 29.58	+ 40.0	23 34 13.67	.	84 58 32.9	— 0.5
	8	α Andromedæ		9	2 39.27	— 0.02	— 0.64	10 19 53.50	+ 4 52.67	+ 11.0	0 2 38.54	.	61 31 18.4	+ 0.1
	9	γ Pegasi		9	7 31.67	— 0.29	— 0.72	24 13 57.78	+ 5 15.30	+ 27.0	0 7 30.67	.	75 26 1.3	— 0.4
	10	β Andromedæ		9	3 31.57	+ 0.13	— 0.75	3 47 56.95	+ 3 42.79	+ 4.0	1 3 31.04	.	54 58 4.9	+ 0.5
	11	Polaris		9	18 13.67	+ 43.20	— 0.65	310 7 58.12	+ 3 52.19	— 1 10.9	1 18 56.22	.	1 17 0.6	+ 1.1
	12	Harmonia		9	56 20.76	— 0.45	— 0.61	33 27 58.40	+ 5 1.75	+ 39.9	1 56 19.70	.	84 46 1.3	— 3.9
	13	α Arietis		9	0 55.47	— 0.14	— 0.53	15 53 57.80	+ 3 12.19	+ 17.2	2 0 54.72	.	67 3 48.4	— 0.1
	14	Iris		7	.	.	.	18 41 56.38	+ 3 13.20	+ 20.5	2 7.9	.	69 51 51.3	— 3.3
	15	Polyhymnia		9.5	35 8.71	— 0.24	— 0.58	21 25 56.50	+ 4 44.00	+ 23.8	2 35 7.89	.	72 37 25.5	— 2.6
	16	η Tauri		9	40 53.60	— 0.12	— 0.50	15 3 55.50	+ 3 49.76	+ 16.4	3 40 52.96	.	66 14 22.9	— 1.0
	17	γ^1 Eridani		9	52 52.38	— 0.77	— 0.54	52 35 58.20	+ 5 54.41	+ 1 19.3	3 52 51.10	.	103 49 33.1	+ 0.7
	18	γ Tauri		9	13 29.13	— 0.28	— 0.48	23 28 2.32	+ 3 41.16	+ 26.4	4 13 28.36	.	74 38 31.1	— 0.5
	19	D. M. — 0°, 706		9	22 18.12	— 0.56	— 0.48	39 39 52.88	+ 5 43.24	+ 50.4	4 22 17.08	— 2.91	90 52 47.7	+ 6.1
	20	α Tauri		9	29 33.62	— 0.26	— 0.54	22 31 54.25	+ 4 15.63	+ 25.2	4 29 32.89	.	73 42 56.3	+ 0.1
19, W.	21	Polaris, S. P.		5	19 47.32	— 53.37	— 0.78	307 34 . . .	.	.	1 18 53.17	.	358 43 . . .	.
	22	η Bootis		9	49 22.24	— 0.10	— 0.70	19 51 57.90	+ 3 52.62	+ 21.7	13 49 21.38	.	71 2 33.4	— 0.5
	23	α Bootis		9	10 34.23	— 0.08	— 0.83	19 4 0.32	+ 3 28.41	+ 20.7	14 10 33.39	.	70 14 10.6	— 0.6
	24	ρ Bootis		9	27 0.66	+ 0.20	— 0.74	7 58 0.65	+ 3 48.22	+ 8.4	14 27 0.11	.	59 8 18.5	— 0.5
20	25	Sun I, S.		9	45 21.80	— 0.90	— 0.72	58 57 59.42	+ 5 11.95	+ 1 39.2	15 45 20.18	+ 69.19	110 11 11.8	.
	26	Sun II, N.		9	47 40.19	— 0.90	— 0.72	58 25 54.32	+ 4 49.49	+ 1 37.2	15 47 38.57	— 69.20	109 38 42.2	.
	27	β Ophiuchi		9	37 58.03	— 0.40	— 0.68	34 11 58.70	+ 3 58.94	+ 40.6	17 37 56.95	.	85 22 59.4	+ 0.4
	28	μ Herculis		9	42 4.96	+ 0.12	— 0.64	11 1 59.08	+ 4 7.17	+ 11.7	17 42 4.40	.	62 12 39.1	+ 0.7
	29	Venus I, S.		9	11 34.26	— 1.02	— 0.67	63 55 58.65	+ 5 24.90	+ 2 1.8	18 11 32.57	+ 0.48	115 9 46.6	.
	30	Venus N.		.	.	.	.	63 55 58.65	+ 5 8.89	+ 2 1.8	.	.	115 9 30.5	.
	31	α Lyre		9	33 8.84	+ 0.43	— 0.68	0 7 57.90	+ 4 37.84	+ 0.2	18 33 8.61	.	51 18 57.1	+ 0.7
	32	β Lyre		9	45 57.16	+ 0.26	— 0.68	5 35 56.92	+ 3 20.39	+ 5.9	18 45 56.76	.	56 45 44.4	— 0.3
21, E.	33	Polaris, S. P.		4	19 42.28	— 50.25	+ 0.17	307 33 51.40	+ 4 10.62	— 1 19.3	1 18 52.20	.	358 43 3.9	+ 0.3
	34	η Bootis		9	49 21.25	— 0.01	+ 0.24	19 51 59.68	+ 3 50.33	+ 22.2	13 49 21.43	.	71 2 33.4	— 1.0
	35	α Bootis		9	10 33.23	0.00	+ 0.13	19 3 55.08	+ 3 33.71	+ 21.2	14 10 33.43	.	70 14 11.2	— 0.6
	36	θ Bootis		8	21 20.76	+ 1.05	+ 0.19	346 27 51.15	+ 4 7.90	— 14.6	14 21 22.01	.	37 38 5.6	+ 0.6
	37	ρ Bootis		9	26 59.66	+ 0.27	+ 0.23	7 57 52.58	+ 3 56.77	+ 8.6	14 27 0.14	.	59 8 19.2	— 0.5
22	38	Mercury II, C.		9	42 11.68	— 0.66	+ 0.21	52 23 56.15	+ 4 44.64	+ 1 19.1	14 42 11.23	— 0.20	103 36 21.1	.
	39	Sun I, N.		9	53 45.10	— 0.80	+ 0.25	58 52 0.58	+ 4 31.07	+ 1 40.2	15 53 44.55	+ 69.48	110 4 33.0	.
	40	Sun II, S.		9	56 4.06	— 0.80	+ 0.25	59 23 57.88	+ 5 4.80	+ 1 42.3	15 56 3.51	— 69.48	110 37 6.2	.
	41	α^1 Herculis		8	9 32.46	— 0.11	+ 0.25	24 17 59.75	+ 3 58.10	+ 27.3	17 9 32.64	.	75 28 46.3	— 0.3
	42	α Ophiuchi		9	29 44.27	— 0.15	+ 0.26	26 9 56.35	+ 4 34.15	+ 29.7	17 29 44.42	.	77 21 21.4	+ 0.7
	43	μ Herculis		9	42 3.89	+ 0.19	+ 0.35	11 1 58.20	+ 4 8.10	+ 11.8	17 42 4.39	.	62 12 39.3	+ 0.5
	44	Venus I, C.		9	22 22.28	— 0.91	+ 0.33	63 55 59.75	+ 4 15.24	+ 2 2.9	18 22 21.70	+ 0.49	115 8 39.1	.
	45	α Lyre		3	33 7.69	+ 0.49	+ 0.38	0 8 1.35	+ 4 34.52	+ 0.2	18 33 8.52	.	51 18 57.3	+ 0.4
29, S.	46	β Bootis		9	57 38.79	+ 0.57	+ 3.84	357 59 59.88	+ 3 52.79	— 2.0	14 57 43.19	.	49 10 11.9	0.0
	47	β Libræ		9	10 56.41	— 0.81	+ 3.84	47 45 55.22	+ 4 48.63	+ 1 4.5	15 10 59.43	.	98 58 9.5	— 0.3
	48	Mercury C.		9	26 58.12	— 1.02	+ 3.83	56 21 58.15	+ 4 55.00	+ 1 27.8	15 27 0.93	— 0.02	107 34 42.2	.
	49	α Serpentis		9	38 42.12	— 0.44	+ 3.80	32 1 59.22	+ 4 22.14	+ 36.6	15 38 45.51	.	83 13 19.2	+ 0.4
30	50	Sun I, N.		9	27 52.10	— 1.13	+ 3.83	60 19 58.30	+ 4 20.00	+ 1 42.1	16 27 54.80	+ 70.16	111 32 21.6	.

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3		Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°				''		' ''	' ''	''	' ''
5	30.12	45.8	43.2	3, 20.	One bisection.	1 to 5	+ 71.72	2	— 44 26.4	— 15 22.8	.	— 59 49.2
6	30.33	48.0	44.8			6 to 20	+ 71.10	6	— 41 10.6	— 15 11.6	.	— 56 22.2
15	30.35	42.4	38.7	2, 6, 11.	Three bisections.	22 to 32	+ 68.73	25	— 7.7	— 16 14.8	.	— 16 22.5
17	30.36	40.8	37.3			33 to 45	+ 68.21	26	— 7.6	+ 16 14.8	.	+ 16 7.2
20	30.38	40.5	36.9	12, 15, 19, 35.	Four bisections.	46 to 50	+ 68.33	29	— 6.1	— 8.0	0.0	— 14.1
22	30.37	44.4	43.0					30	— 6.1	+ 8.1	.	+ 2.0
26	30.37	45.0	44.3					38	— 6.2	.	— 0.3	— 6.5
28	30.36	45.2	44.6					39	— 7.7	+ 16 16.6	.	+ 16 8.9
32	30.36	45.3	44.7					40	— 7.7	— 16 16.6	.	— 16 24.3
33	30.36	31.8	31.5					44	— 6.2	.	0.0	— 6.2
40	30.35	37.0	37.5					48	— 5.7	.	— 0.1	— 5.8
45	30.34	41.0	40.0					50	— 7.8	+ 16 14.9	.	+ 16 7.1
46	29.84	44.6	45.8									
49	29.83	46.0	47.0									

DATE AND OBS'R.	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 7, W.	1	Moon I, S. . . .	.	9	m. s. 20 1.69	s. — 0.83	+ 6.87	° / // 57 43 57.45	+ 3 33.24	+ 1 33.7	h. m. s. 21 20 7.73	+ 69.67	° / // 108 55 25.6	..
	2	ϵ Piscium	.	9	57 3.80	— 0.23	+ 6.79	31 31 52.68	+ 3 41.37	+ 36.7	0 57 10.46	.	82 42 31.9	— 0.2
	3	β Andromedæ	.	9	3 23.29	+ 0.50	+ 6.95	3 47 54.80	+ 3 41.92	+ 4.0	1 3 30.68	.	54 58 1.9	— 0.4
	4	Polaris	.	9	17 38.42	+ 56.78	+ 6.89	310 7 55.05	+ 3 45.92	— 1 10.6	1 18 42.09	.	1 16 51.6	— 0.3
	5	η Piscium	.	8	25 25.33	— 0.06	+ 6.94	24 1 55.20	+ 4 55.28	+ 26.7	1 25 32.17	.	75 13 38.4	— 0.2
11, S.	6	α Coronæ Borealis	.	9	29 46.96	+ 0.12	+ 9.87	11 43 48.68	+ 4 13.89	+ 12.5	15 29 56.93	.	62 54 36.3	— 0.4
	7	α Serpentis	.	9	38 36.27	— 0.42	+ 9.83	32 1 54.25	+ 4 28.82	+ 37.6	15 38 45.70	.	83 13 21.9	+ 0.6
	8	ϵ Serpentis	.	9	45 5.23	— 0.47	+ 9.85	33 59 52.82	+ 4 12.79	+ 40.5	15 45 14.61	.	85 11 7.3	— 0.1
	9	β Scorpii	.	9	58 47.62	— 1.08	+ 9.85	58 18 . . .	.	.	15 58 56.39	.	109 30 . . .	..
	10	Mercury C. . . .	.	9	42 39.03	— 1.16	+ 9.86	61 17 53.38	+ 3 46.79	+ 1 49.2	16 42 47.73	0.00	112 29 50.6	..
12	11	Sun I, S. . . .	.	9	20 15.46	— 1.17	+ 9.87	62 11 50.40	+ 5 51.68	+ 1 53.4	17 20 24.16	+ 71.02	113 25 56.7	..
	12	Sun II, N. . . .	.	9	22 37.49	— 1.17	+ 9.88	61 39 52.65	+ 5 22.66	+ 1 50.9	17 22 46.20	— 71.02	112 53 27.4	..
	13	ζ Aquilæ	.	9	0 6.57	— 0.25	+ 9.88	25 5 53.05	+ 5 17.26	+ 28.1	19 0 16.22	.	76 17 59.6	+ 0.9
	14	γ Aquilæ	.	9	40 47.17	— 0.34	+ 9.92	28 27 52.75	+ 4 34.31	+ 32.4	19 40 56.74	.	79 39 20.7	0.0
	15	α Aquilæ	.	9	45 10.30	— 0.38	+ 9.93	30 13 50.78	+ 4 37.71	+ 34.8	19 45 19.83	.	81 25 24.5	— 0.1
	16	β Aquilæ	.	9	49 40.00	— 0.44	+ 9.88	32 41 52.55	+ 3 17.51	+ 38.3	19 49 49.47	.	83 52 9.6	— 0.1
	17	Venus I, N. . . .	.	6	8 7.93	— 1.15	+ 9.92	61 5 49.60	+ 4 6.82	+ 1 47.8	20 8 16.70	+ 0.45	112 18 5.4	..
	18	Venus II, S. . . .	.	5	8 8.64	— 1.15	+ 9.92	61 5 49.60	+ 4 20.76	+ 1 47.9	20 8 17.41	— 0.26	112 18 19.5	..
	19	γ Cygni	.	9	18 2.20	+ 0.57	+ 9.94	358 55 52.75	+ 3 31.54	— 1.1	20 18 12.69	.	50 5 44.4	— 0.9
W.	20	β Libræ	.	9	10 50.48	— 0.71	+ 9.95	47 45 52.00	+ 4 51.42	+ 1 6.6	15 10 59.72	.	98 58 11.2	— 0.3
	21	μ^1 Bootis	.	9	20 4.94	+ 0.52	+ 9.95	1 3 51.22	+ 3 44.36	+ 1.2	15 20 15.41	.	52 13 58.0	+ 0.6
	22	α Coronæ Borealis	.	9	29 46.81	+ 0.17	+ 9.99	11 43 54.75	+ 4 7.85	+ 12.6	15 29 56.93	.	62 54 36.4	— 0.6
	23	α Serpentis	.	9	38 36.13	— 0.35	+ 9.92	32 1 56.82	+ 4 25.17	+ 37.8	15 38 45.74	.	83 13 21.0	— 0.6
	24	Mercury C. . . .	.	9	49 15.68	— 1.06	+ 9.99	61 35 53.55	+ 4 16.49	+ 1 50.8	16 49 24.61	0.00	112 48 22.0	..
13	25	Sun I, N. . . .	.	9	24 40.62	— 1.07	+ 10.01	61 43 55.30	+ 5 5.90	+ 1 51.3	17 24 49.56	+ 70.97	112 57 13.7	..
	26	Sun II, S. . . .	.	9	27 2.57	— 1.07	+ 10.01	62 15 54.98	+ 5 36.11	+ 1 53.8	17 27 11.51	— 70.98	113 29 46.1	..
	27	α Aquilæ	.	9	45 10.09	— 0.31	+ 10.06	30 13 55.18	+ 4 34.16	+ 35.0	19 45 19.85	.	81 25 25.5	+ 0.7
	28	Venus I, S. . . .	.	9	13 14.02	— 1.03	+ 10.09	60 50 1.22	+ 4 32.70	+ 1 47.3	20 13 23.08	+ 0.53	112 2 42.4	..
	29	Venus N. . . .	.	.	.	.	.	60 50 1.22	+ 4 15.48	+ 1 47.2	.	.	112 2 25.1	..
	30	γ Cygni	.	8	18 2.01	+ 0.59	+ 10.10	358 55 58.68	+ 3 27.03	— 1.1	20 18 12.69	.	50 5 45.8	+ 0.3
	31	ϵ Piscium	.	9	57 0.62	— 0.35	+ 10.03	31 31 54.88	+ 3 39.03	+ 37.6	0 57 10.37	.	82 42 32.7	+ 0.4
	32	β Andromedæ	.	9	3 20.16	+ 0.40	+ 10.10	3 47 55.70	+ 3 40.60	+ 4.1	1 3 30.66	.	54 58 1.6	— 0.4
	33	Comet 1889, I	.	9	12 47.68	— 0.70	+ 10.10	46 21 54.20	+ 6 4.31	+ 1 4.3	1 12 57.08	.	97 35 24.0	..
	34	Polaris	.	6	17 29.81	+ 57.43	+ 10.10	310 7 55.52	+ 3 47.39	— 1 12.3	1 18 37.34	.	1 16 51.8	+ 1.1
	35	α Piscium	.	9	39 21.67	— 0.32	+ 10.17	30 13 52.50	+ 3 19.70	+ 35.8	1 39 31.46	.	81 24 9.2	— 0.6
	36	ζ Ceti	.	9	45 49.13	— 0.78	+ 10.14	49 41 54.52	+ 3 45.05	+ 1 12.3	1 45 58.46	.	100 53 13.1	— 2.3
	37	β Arietis	.	9	48 20.07	— 0.04	+ 10.12	18 33 53.60	+ 3 31.76	+ 20.6	1 48 30.14	.	69 44 7.2	— 0.1
	38	Weisse 925	.	9	53 50.89	— 0.68	+ 10.11	45 43 54.30	+ 4 8.26	+ 1 2.9	1 54 0.32	— 2.63	96 55 26.7	+ 8.1
	39	Weisse 1077	.	9	1 47.94	— 0.68	+ 10.11	45 41 55.28	+ 4 24.46	+ 1 2.9	2 1 57.37	— 2.67	96 53 43.8	+ 7.8
	40	Moon I, S. . . .	.	9	17 20.06	— 0.35	+ 10.11	31 1 56.25	+ 4 33.77	+ 37.0	2 17 29.82	+ 61.80	82 13 28.2	..
	41	ξ^2 Ceti	.	9	22 5.49	— 0.34	+ 10.07	30 51 55.58	+ 3 27.99	+ 36.7	2 22 15.26	.	82 2 21.5	— 0.4
S.	42	μ^1 Bootis	.	6	20 4.18	+ 0.53	+ 10.73	1 4 . . .	.	.	15 20 15.45	.	52 14 . . .	..
	43	α Coronæ Borealis	.	9	29 46.03	+ 0.18	+ 10.78	11 43 52.75	+ 4 9.74	+ 12.8	15 29 56.96	.	62 54 36.5	— 0.8
	44	α Serpentis	.	9	38 35.32	— 0.34	+ 10.74	32 1 53.12	+ 4 27.87	+ 38.5	15 38 45.74	.	83 13 20.7	— 1.1
	45	β Herculis	.	9	25 13.67	+ 0.03	+ 10.79	17 3 52.15	+ 5 27.96	+ 18.9	16 25 24.49	.	68 16 0.2	+ 0.6
14	46	Mercury C. . . .	.	9	55 53.96	— 1.07	+ 10.81	61 51 54.12	+ 5 31.45	+ 1 54.4	16 56 3.60	0.00	113 5 41.2	..
	47	Sun I, N. . . .	.	9	29 5.13	— 1.08	+ 10.83	61 47 57.25	+ 4 23.57	+ 1 53.8	17 29 14.88	+ 71.09	113 0 35.8	..
	48	Sun II, S. . . .	.	9	31 27.31	— 1.08	+ 10.84	62 20 1.38	+ 4 47.79	+ 1 56.4	17 31 37.07	— 71.10	113 33 6.8	..
	49	α Lyræ	.	9	32 56.92	+ 0.57	+ 10.94	0 7 54.48	+ 4 47.88	+ 0.2	18 33 8.37	.	51 19 3.8	+ 0.9
	50	γ Aquilæ	.	9	40 46.13	— 0.26	+ 10.87	28 28 . . .	.	.	19 40 56.79	.	79 39 . . .	..
For summary of the constants of reduction, see page B.3														
No.	Barom.	At. Ther.	Ex. Ther.					Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						..		..	..	..	..
1	30.06	44.7	43.6	4, 40. Three bisections.				1	+ 50.18	1	— 49 15.2	— 15 56.4	.	— 65 11.6
2	30.05	40.2	38.8					2 to 5	+ 50.38	10	— 5.5	.	0.0	— 5.5
6	29.93	37.8	35.8	24, 33. Four bisections.				6 to 19	+ 49.50	11	— 8.0	— 16 14.6	.	— 16 22.6
9	29.93	37.6	35.5					20 to 30	+ 50.67	12	— 7.9	+ 16 14.6	.	+ 16 6.7
12	29.93	37.9	36.6	I. Five bisections.				31 to 41	+ 50.90	17	— 6.6	+ 7.1	— 0.1	+ 0.4
13	29.91	38.5	37.3					43 to 49	+ 49.14	18	— 6.6	— 7.1	.	— 13.7
19	29.00	38.8	37.8							24	— 5.5	.	0.0	— 5.5
20	29.88	32.2	31.3							25	— 7.9	+ 16 16.2	.	+ 16 8.3
24	29.87	34.6	34.1							26	— 8.0	— 16 16.2	.	— 16 24.2
26	29.85	35.3	35.1							28	— 6.6	— 8.7	.	— 15.3
27	29.85	35.8	34.8							29	— 6.6	+ 8.7	— 0.1	+ 2.0
31	29.98	28.8	26.9							40	— 27 50.0	— 14 48.3	.	— 42 38.3
41	30.01	27.8	21.6							46	— 5.5	.	0.0	— 5.5
44	30.17	29.2	28.2							47	— 7.9	+ 16 15.5	.	+ 16 7.6
46	30.17	30.9	29.4							48	— 8.0	— 16 15.5	.	— 16 23.5
48	30.16	31.0	30.3											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 14, S.	1	α Aquilæ	9	45	9.22	— 0.30	+ 10.92	30 13 56.60	+ 4 32.05	+ 35.6	19 45 19.85	.	81 25 25.4	+ 0.5
	2	Venus I, N.	6	18	17.92	— 1.03	+ 10.95	60 33 54.68	+ 4 2.90	+ 1 47.7	20 18 27.84	+ 0.63	111 46 6.5	.
	3	Venus II, S.	5	18	18.90	— 1.03	+ 10.95	60 33 54.68	+ 4 18.81	+ 1 47.8	20 18 28.82	— 0.35	111 46 22.5	.
E.	4	ϵ Piscium	8	56	59.69	— 0.38	+ 10.98	31 31 59.50	+ 3 33.02	+ 37.9	0 57 10.29	.	82 42 31.6	— 0.8
	5	β Andromedæ	9	3	19.26	+ 0.37	+ 11.02	3 47 56.58	+ 3 39.75	+ 4.2	1 3 30.61	.	54 58 1.7	— 0.3
	6	Comet 1889, I	9	8	40.92	— 0.72	+ 10.98	46 21 57.08	+ 8 4.50	+ 1 5.0	1 8 51.18	.	97 37 27.8	.
	7	Polaris	6	17	28.46	+ 57.03	+ 10.99	310 7 58.22	+ 3 44.35	— 1 12.9	1 18 36.48	.	1 16 50.9	+ 0.4
	8	η Piscium	9	25	21.34	— 0.20	+ 11.01	24 2 . . .	.	.	1 25 32.13	.	75 14 . . .	.
	9	ϕ Piscium	9	39	20.89	0.34	+ 10.96	30 13 55.40	+ 3 18.60	+ 36.1	1 39 31.55	.	81 24 11.3	+ 1.5
	10	ζ Ceti	9	45	48.36	— 0.79	+ 10.91	49 41 53.88	+ 3 42.98	+ 1 12.9	1 45 58.58	.	100 53 11.0	— 4.5
	11	β Arietis	9	48	19.22	— 0.06	+ 10.98	18 33 55.58	+ 3 30.44	+ 20.8	1 48 30.17	.	69 44 8.0	+ 0.7
	12	Weisse 925	9	53	50.26	— 0.70	+ 11.01	45 41 57.48	+ 6 3.76	+ 1 3.5	1 54 0.57	— 2.62	96 55 25.9	+ 8.0
	13	Weisse 1077	9	1	47.19	— 0.70	+ 11.02	45 41 57.48	+ 4 21.97	+ 1 3.4	2 1 57.51	— 2.64	96 53 44.0	+ 7.7
	14	β Trianguli	8	2	44.72	+ 0.35	+ 11.14	4 21 56.55	+ 3 53.46	+ 4.8	2 2 56.09	.	55 32 16.0	+ 0.2
	15	67 Ceti	9	11	16.18	— 0.70	+ 11.02	45 43 57.42	+ 4 49.24	+ 1 3.6	2 11 26.50	.	96 56 11.5	— 0.9
	16	α Ceti	9	56	17.98	— 0.46	+ 10.99	35 9 55.90	+ 3 50.73	+ 43.7	2 56 28.57	.	86 20 11.5	— 1.4
	17	β Persei	9	0	45.32	+ 0.57	+ 11.05	358 17 53.98	+ 4 7.35	— 1.8	3 0 56.94	.	49 28 20.7	— 0.1
	18	Moon I, S.	8	4	8.51	— 0.27	+ 11.06	26 53 58.00	+ 5 34.95	+ 31.6	3 4 19.30	+ 62.45	78 6 25.8	.
	19	f Tauri	9	24	33.83	— 0.25	+ 11.07	26 15 53.05	+ 3 58.89	+ 30.7	3 24 44.65	.	77 26 43.8	— 0.1
	20	ϵ Eridani	9	27	31.78	— 0.77	+ 11.10	48 37 56.32	+ 4 45.31	+ 1 10.6	3 27 42.08	.	99 50 13.4	+ 1.3
	21	δ Persei	9	34	49.81	+ 0.87	+ 11.06	351 23 53.35	+ 4 0.02	— 9.3	3 35 1.76	.	42 34 5.3	+ 0.2
	22	η Tauri	9	40	42.11	+ 0.03	+ 11.07	15 3 53.95	+ 3 50.23	+ 16.8	3 40 53.22	.	66 14 22.2	— 0.3
	23	ζ Persei	9	46	58.02	+ 0.26	+ 11.14	7 15 52.92	+ 4 28.04	+ 8.0	3 47 9.36	.	58 26 50.2	— 0.2
	24	Neptune	9	53	50.79	— 0.10	+ 11.09	20 15 56.92	+ 4 45.67	+ 23.0	3 54 1.78	.	71 27 26.8	.
W.	25	β Bootis	.	.	.	.	.	357 59 52.88	+ 4 3.61	— 2.1	14 57.7 . . .	.	49 10 15.6	— 1.3
	26	β Libræ	9	10	49.23	— 0.67	+ 11.21	47 45 59.05	+ 4 42.35	+ 1 8.8	15 10 59.84	.	98 58 11.4	— 0.4
	27	μ^1 Bootis	9	20	3.60	+ 0.56	+ 11.30	1 3 54.20	+ 3 40.89	+ 1.2	15 20 15.44	.	52 13 57.5	— 0.6
	28	α Coronæ Borealis	9	29	45.46	+ 0.21	+ 11.34	11 43 56.10	+ 4 5.79	+ 13.0	15 29 56.96	.	62 54 36.1	— 1.5
15	29	Sun I, N.	9	33	30.49	— 1.03	+ 11.39	61 49 57.40	+ 5 15.56	+ 1 54.2	17 33 40.85	+ 71.12	113 3 28.4	.
	30	Sun II, S.	9	35	52.73	— 1.03	+ 11.39	62 22 1.32	+ 5 41.22	+ 1 56.8	17 36 3.09	— 71.12	113 36 0.5	.
	31	β Aquilæ	9	49	38.30	— 0.32	+ 11.45	32 41 57.32	+ 3 14.00	+ 39.0	19 49 49.47	.	83 52 11.5	+ 1.4
	32	α^2 Capricorni	7	11	40.85	— 0.76	+ 11.51	51 41 56.72	+ 3 46.06	+ 1 16.8	20 11 51.60	.	102 53 20.8	+ 0.1
	33	γ Cygni	9	18	0.47	+ 0.64	+ 11.57	358 55 57.70	+ 3 28.96	— 1.1	20 18 12.62	.	50 5 46.8	+ 0.8
	34	Venus I, S.	9	23	20.79	— 0.98	+ 11.52	60 15 57.42	+ 5 26.44	+ 1 46.0	20 23 31.33	+ 0.53	111 29 31.1	.
	35	Venus N.	.	.	.	.	.	60 15 57.42	+ 5 9.45	+ 1 46.0	.	.	111 29 14.1	.
	36	ϵ Delphini	9	27	41.28	— 0.21	+ 11.50	27 53 57.72	+ 3 31.97	+ 32.1	20 27 52.59	.	79 4 23.0	+ 0.6
	37	δ Persei	9	34	49.31	+ 0.98	+ 11.45	351 23 56.08	+ 3 56.26	— 9.2	3 35 1.80	.	42 34 4.3	— 0.6
	38	η Tauri	9	40	41.63	+ 0.12	+ 11.46	15 3 54.25	+ 3 50.49	+ 16.6	3 40 53.26	.	66 14 22.5	0.0
	39	ζ Persei	9	46	57.50	+ 0.36	+ 11.56	7 15 56.68	+ 4 24.24	+ 7.9	3 47 9.37	.	58 26 50.0	— 0.3
	40	ζ Ursæ Minoris, S.P.	6	47	51.70	— 6.74	+ 11.51	296 59 55.28	+ 3 49.78	— 1 59.3	15 47 56.47	.	348 8 7.0	+ 0.7
	41	Moon I, S.	9	52	16.08	— 0.08	+ 11.51	23 19 56.35	+ 4 34.84	+ 26.5	3 52 27.51	+ 63.43	74 31 18.9	.
	42	γ Tauri	9	13	17.21	— 0.09	+ 11.58	23 27 57.48	+ 3 46.84	+ 26.6	4 13 28.63	.	74 38 32.1	+ 0.1
17, S.	43	α Serpentis	9	38	33.94	— 0.09	+ 11.95	32 2 . . .	.	.	15 38 45.74	.	83 13 . . .	.
	44	δ Ophiuchi	9	8	17.73	— 0.28	+ 11.92	42 11 53.00	+ 5 12.32	+ 53.2	16 8 29.35	.	93 24 19.7	— 1.1
	45	α Scorpii	9	22	22.27	— 0.75	+ 11.91	64 59 52.58	+ 2 34.62	+ 2 5.1	16 22 33.42	.	116 10 53.5	— 2.1
	46	β Herculis	5	25	12.53	+ 0.21	+ 11.82	17 3 53.32	+ 5 26.50	+ 18.1	16 25 24.64	.	68 15 59.1	— 1.6
18	47	Mercury C.	9	22	51.76	— 0.70	+ 11.92	62 51 57.85	+ 3 12.18	+ 1 54.0	17 23 2.98	0.00	114 3 25.2	.
	48	Sun I, S.	9	46	47.67	— 0.68	+ 11.93	62 27 59.35	+ 5 43.72	+ 1 52.3	17 46 58.92	+ 71.14	113 41 56.6	.
	49	Sun II, N.	9	49	9.96	— 0.68	+ 11.93	61 55 54.25	+ 5 18.94	+ 1 49.7	17 49 21.21	— 71.15	113 9 24.1	.
	50	δ Aquilæ	9	19	40.03	— 0.16	+ 11.88	35 55 54.38	+ 3 22.78	+ 42.5	19 19 51.82	.	87 6 20.9	+ 1.4
For summary of the constants of reduction, see page B.3														
No.	Barom.	At. Ther.	Ex. Ther.					Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						//		//	//	//	//
2	30.17	33.0	32.1	11, 17, 32. One bisection.				1 to 3	+ 49.14	2	— 6.6	+ 8.0	0.0	+ 1.4
4	30.29	29.0	27.5	6, 7, 18, 41. Three bisections.				4 to 24	+ 49.80	3	— 6.6	— 8.0	.	— 14.6
24	30.33	28.0	25.0					25 to 36	+ 48.28	18	— 24 20.5	— 14 45.2	.	— 39 5.7
25	30.48	25.7	24.3	24. Four bisections.				37 to 42	+ 49.98	24	— 0.1	.	.	— 0.1
30	30.43	33.6	34.0					44 to 50	+ 52.20	29	— 7.9	+ 16 16.0	.	+ 16 8.1
36	30.38	37.4	37.7							30	— 8.0	— 16 16.0	.	— 16 24.0
37	30.32	32.4	31.3							34	— 6.7	— 8.5	.	— 15.2
42	30.32	32.6	31.6							35	— 6.7	+ 8.6	+ 0.1	+ 1.8
46	29.50	41.5	39.6							41	— 21 15.5	— 14 44.2	.	— 35 59.7
49	29.52	41.5	40.2							47	— 5.5	.	0.0	— 5.5
50	29.54	42.6	40.5							48	— 8.0	— 16 16.2	.	— 16 24.2
										49	— 7.9	+ 16 16.2	.	+ 16 8.3

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 18, S.					m. s.	s.	s.	° / "	/ "	/ "	h. m. s.	s.	° / "	/ "
	1	γ Aquilæ	.	9	40 44.82	— 0.02	+ 11.94	28 27 55.90	+ 4 33.46	+ 31.8	19 40 56.76	.	79 39 22.4	+ 0.7
	2	α Aquilæ	.	9	45 7.90	— 0.06	+ 12.00	30 13 51.05	+ 4 40.66	+ 34.2	19 45 19.80	.	81 25 27.1	+ 1.5
	3	γ Cygni	.	9	17 59.96	+ 0.69	+ 12.00	358 55 52.58	+ 3 33.89	— 1.0	20 18 12.62	.	50 5 46.7	0.0
	4	ϵ Delphini	.	9	27 40.58	— 0.01	+ 11.99	27 53 52.75	+ 3 39.15	+ 31.0	20 27 52.54	.	79 4 24.1	+ 1.2
	5	Venus I, N. . . .	.	6	38 20.83	— 0.62	+ 11.97	59 21 55.20	+ 5 5.09	+ 1 38.7	20 38 32.18	+ 0.56	110 35 0.2	.
	6	Venus II, S. . . .	.	5	38 21.70	— 0.62	+ 11.97	59 21 55.20	+ 5 20.50	+ 1 38.7	20 38 33.05	— 0.31	110 35 15.6	.
19, E.	7	α Coronæ Borealis	.	9	29 44.43	+ 0.49	+ 12.21	11 43 52.02	+ 4 11.96	+ 13.0	15 29 57.05	.	62 54 38.2	— 0.9
	8	α Serpentis	.	9	38 33.61	+ 0.15	+ 12.10	32 1 53.85	+ 4 29.51	+ 38.9	15 38 45.90	.	83 13 23.5	+ 0.3
	9	β Herculis	.	9	25 12.09	+ 0.39	+ 12.12	17 3 49.70	+ 5 32.00	+ 19.1	16 25 24.64	.	68 16 2.0	+ 0.7
20	10	Sun I, N. . . .	.	9	55 39.77	— 0.33	+ 12.22	61 57 55.58	+ 4 41.09	+ 1 55.0	17 55 51.66	+ 71.20	113 10 52.9	.
	11	Sun II, S. . . .	.	9	58 2.17	— 0.33	+ 12.22	62 31 51.08	+ 3 19.28	+ 1 57.7	17 58 14.06	— 71.20	113 43 29.3	.
	12	ζ Aquilæ	.	9	0 3.74	+ 0.26	+ 12.21	25 5 52.15	+ 5 18.86	+ 28.7	19 0 16.26	.	76 18 0.9	+ 0.6
	13	β Cygni	.	9	25 59.72	+ 0.50	+ 12.26	11 5 54.32	+ 3 51.37	+ 12.0	19 26 12.50	.	62 16 18.9	+ 0.6
	14	γ Aquilæ	.	9	40 44.24	+ 0.21	+ 12.29	28 27 57.05	+ 4 31.36	+ 33.1	19 40 56.74	.	79 39 22.7	+ 0.6
	15	α Aquilæ	.	9	45 7.31	+ 0.18	+ 12.35	30 13 52.32	+ 4 35.64	+ 35.6	19 45 19.78	.	81 25 24.8	— 1.1
	16	ϵ Cygni	.	9	41 28.31	+ 0.62	+ 12.32	5 15 55.48	+ 4 13.92	+ 5.7	20 41 41.25	.	56 26 36.3	— 1.0
	17	Venus I, S. . . .	.	9	48 13.03	— 0.27	+ 12.33	58 43 55.20	+ 4 21.69	+ 1 40.0	20 48 25.09	+ 0.54	109 56 18.1	.
	18	Weisse (2) 20	.	3	4 4.72	+ 0.44	+ 12.39	13 55 54.62	+ 5 17.15	+ 15.3	1 4 17.55	— 2.67	65 7 48.3	+ 19.8
	19	Polaris	.	7	17 41.33	+ 38.02	+ 12.38	310 7 53.25	+ 3 49.32	— 1 12.4	1 18 31.73	.	1 16 51.4	+ 2.2
	20	η Piscium	.	9	25 19.41	+ 0.27	+ 12.41	24 1 53.92	+ 4 57.15	+ 27.4	1 25 32.06	.	75 13 39.7	+ 0.8
	21	σ Piscium	.	9	39 18.88	+ 0.17	+ 12.41	30 13 49.90	+ 3 21.71	+ 35.8	1 39 31.43	.	81 24 8.6	— 1.6
	22	ζ Ceti	.	9	45 46.23	— 0.13	+ 12.33	49 41 54.65	+ 3 43.80	+ 1 12.3	1 45 58.47	.	100 53 11.9	— 4.3
	23	β Arietis	.	9	48 17.41	+ 0.36	+ 12.32	18 33 48.62	+ 3 38.17	+ 20.7	1 48 30.14	.	69 44 8.7	+ 1.4
	24	B. A. C. 653	.	9	2 27.64	+ 1.19	+ 12.36	345 29 55.75	+ 4 49.07	— 15.8	2 2 41.19	— 4.10	36 40 50.2	+ 23.3
	25	δ Ceti	.	9	11 14.14	— 0.07	+ 12.39	45 43 51.75	+ 4 56.93	+ 1 3.1	2 11 26.43	.	96 56 13.0	0.0
	26	Lalande 4271	.	9	12 28.78	+ 0.40	+ 12.36	16 9 53.92	+ 4 9.34	+ 17.9	2 12 41.54	— 3.12	67 20 42.4	+ 15.4
	27	Lalande 4572	.	9	22 40.92	+ 0.40	+ 12.35	15 49 53.52	+ 5 7.14	+ 17.5	2 22 53.67	— 3.19	67 1 39.4	+ 14.8
	28	Weisse 397	8.0	9	25 23.74	+ 0.07	+ 12.35	37 1 52.72	+ 4 30.27	+ 46.4	2 25 36.16	— 2.85	88 13 30.6	+ 8.7
	29	B. A. C. 776	.	9	25 32.86	+ 0.07	+ 12.35	37 1 52.72	+ 4 37.55	+ 46.4	2 25 45.28	— 2.85	88 13 37.9	+ 8.7
	30	δ Ceti	.	8	33 34.96	+ 0.04	+ 12.37	38 57 57.28	+ 4 3.32	+ 49.8	2 33 47.35	.	90 9 11.6	+ 0.2
	31	γ^2 Ceti	.	9	37 20.33	+ 0.08	+ 12.31	36 1 51.62	+ 5 6.87	+ 44.8	2 37 32.76	.	87 14 4.5	+ 0.6
	32	Lalande 5221	.	9	44 2.78	+ 0.94	+ 12.35	352 25 56.98	+ 4 47.07	— 8.1	2 44 16.07	— 4.13	43 36 57.1	+ 18.4
	33	Weisse (2) 136	.	8	8 21.94	+ 0.54	+ 12.33	8 39 49.48	+ 5 6.33	+ 9.5	3 8 34.81	— 3.65	59 51 26.5	+ 12.9
	34	Weisse (2) 320	.	9	17 20.40	+ 0.60	+ 12.33	5 39 50.32	+ 5 14.10	+ 6.2	3 17 33.33	— 3.80	56 51 31.8	+ 12.7
	35	Lalande 6345	.	9	21 9.52	+ 0.61	+ 12.33	5 23 51.72	+ 4 22.59	+ 5.9	3 21 22.46	— 3.83	56 34 41.4	+ 12.4
	36	f Tauri	.	9	24 32.08	+ 0.23	+ 12.33	26 15 53.75	+ 3 58.11	+ 30.5	3 24 44.64	.	77 26 43.6	— 0.4
	37	Groombridge 703	.	9	26 3.09	+ 0.75	+ 12.33	359 17 53.10	+ 4 19.01	— 0.7	3 26 16.17	— 4.11	50 28 32.6	+ 13.1
	38	B. A. C. 1133	.	9	36 7.27	+ 1.72	+ 12.32	335 49 51.08	+ 4 36.87	— 27.5	3 36 21.31	— 6.15	27 0 21.7	+ 15.1
	39	η Tauri	.	9	40 40.46	+ 0.42	+ 12.33	15 3 48.78	+ 3 55.26	+ 16.7	3 40 53.20	.	66 14 21.9	— 0.4
	40	ζ Persei	.	9	46 56.53	+ 0.57	+ 12.32	7 15 54.68	+ 4 25.57	+ 7.9	3 47 9.42	.	58 26 49.3	— 0.7
	41	Neptune	.	9	53 12.39	+ 0.33	+ 12.31	20 17 53.68	+ 4 29.61	+ 22.9	3 53 25.03	.	71 29 7.4	.
W.	42	α Coronæ Borealis	.	9	29 44.11	+ 0.46	+ 12.58	11 43 52.90	+ 4 12.76	+ 12.7	15 29 57.14	.	62 54 39.6	+ 0.3
	43	α Serpentis	.	9	38 33.17	+ 0.13	+ 12.58	32 1 54.45	+ 4 29.28	+ 38.2	15 38 45.87	.	83 13 23.1	— 0.3
	44	β Herculis	.	8	25 11.69	+ 0.37	+ 12.56	17 4	.	.	16 25 24.64	.	68 16	.
21	45	Sun I, N. . . .	.	9	0 5.80	— 0.34	+ 12.60	61 57 54.88	+ 4 52.93	+ 1 52.1	18 0 18.06	+ 71.29	113 11 1.1	.
	46	Sun II, S. . . .	.	9	2 28.39	— 0.34	+ 12.60	62 29 51.88	+ 5 25.22	+ 1 54.6	18 2 40.65	— 71.30	113 43 32.9	.
	47	Polaris	.	5	17 40.40	+ 37.67	+ 12.68	310 7 53.48	+ 3 46.00	— 1 11.7	1 18 30.75	.	1 16 49.0	0.0
	48	η Piscium	.	5	25 19.06	+ 0.24	+ 12.78	24 2	.	.	1 25 31.98	.	75 14	.
	49	σ Piscium	.	9	39 18.63	+ 0.15	+ 12.67	30 13 51.85	+ 3 21.16	+ 35.5	1 39 31.46	.	81 24 9.7	— 0.5
	50	β Arietis	.	9	48 17.10	+ 0.33	+ 12.65	18 33 51.22	+ 3 34.20	+ 20.5	1 48 30.10	.	69 44 7.1	— 0.2
No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B. 3				Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						"		/ "	/ "	"	/ "
5	29.57	42.6	41.5	19, 47. Three bisections.				1 to 6	+ 52.20	5	—	6.7	+ 7.8	+ 0.9
7	30.28	26.0	24.5					7 to 17	+ 53.81	6	—	6.7	— 7.8	— 14.5
11	30.24	30.2	29.9					18 to 41	+ 54.14	10	—	7.9	+ 16 18.2	+ 16 10.3
16	30.20	34.0	33.0					42 to 46	+ 54.50	11	—	8.0	— 16 18.2	— 16 26.2
19	30.15	29.5	28.5					47 to 50	+ 53.93	17	—	6.7	— 7.6	— 14.3
41	30.10	27.5	25.0							41	—	0.1	.	— 0.1
42	29.90	27.8	26.8							45	—	8.0	+ 16 15.9	+ 16 7.9
46	29.83	34.2	35.9							46	—	8.0	— 16 15.9	— 16 23.9
49	30.00	32.3	30.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 21, W.					m. s.	s.	s.	° ' "	' "	' "	h. m. s.	s.	° ' "	"
	1	α Arietis	9	0	41.67	+ 0.38	+ 12.60	15 53 52.30	+ 3 16.16	+ 17.4	2 0 54.72	.	67 3 47.1	- 0.2
	2	B. A. C. 653	6	2	27.29	+ 1.16	+ 12.67	345 29 54.82	+ 4 49.34	- 15.7	2 2 41.12	- 4.08	36 40 49.7	+ 23.5
	3	Lalande 4271	9	12	28.61	+ 0.38	+ 12.66	16 9 50.20	+ 4 11.82	+ 17.7	2 12 41.65	- 3.11	67 20 40.9	+ 15.4
	4	Lalande 4572	9	22	40.80	+ 0.38	+ 12.66	15 49 57.85	+ 5 2.69	+ 17.4	2 22 53.84	- 3.18	67 1 39.1	+ 14.8
	5	Weisse 397	5	25	23.55	+ 0.04	+ 12.66	37 2 . . .	.	.	2 25 36.25	- 2.84	88 14 . .	+ 8.7
	6	B. A. C. 776	6	25	32.75	+ 0.04	+ 12.66	37 1 54.72	+ 4 36.06	+ 46.1	2 25 45.45	- 2.84	88 13 38.1	+ 8.7
	7	Lalande 5221	9	44	2.49	+ 0.91	+ 12.65	352 25 54.35	+ 4 48.92	- 8.0	2 44 16.05	- 4.12	43 36 56.5	+ 18.5
	8	ϵ Eridani	7	27	29.64	- 0.13	+ 12.58	48 37 56.22	+ 4 47.39	+ 1 9.7	3 27 42.15	.	99 50 14.5	+ 1.4
	9	Lalande 6820	9	37	7.26	+ 0.64	+ 12.63	2 41 52.70	+ 5 11.35	+ 3.0	3 37 20.53	- 4.02	53 53 28.2	+ 11.5
	10	η Tauri	9	40	40.23	+ 0.40	+ 12.58	15 3 53.02	+ 3 51.27	+ 16.6	3 40 53.26	.	66 14 22.1	- 0.2
	11	ζ Persei	8	46	56.14	+ 0.54	+ 12.74	7 15 51.70	+ 4 28.76	+ 7.9	3 47 9.31	.	58 26 49.6	- 0.3
	12	Neptune	9	53	6.36	+ 0.30	+ 12.63	20 17 53.28	+ 4 45.35	+ 22.8	3 53 19.29	.	71 29 22.6	.
S.	13	α Serpentis	9	38	32.67	+ 0.02	+ 13.22	32 1 54.40	+ 4 28.29	+ 39.5	15 38 45.91	.	83 13 23.4	- 0.2
	14	δ Ophiuchi	9	8	16.46	- 0.16	+ 13.16	42 11 52.85	+ 5 10.30	+ 57.1	16 8 29.55	.	93 24 21.5	0.0
	15	τ Herculis	9	16	7.57	+ 0.94	+ 13.27	352 13 48.78	+ 5 18.63	- 8.5	16 16 21.76	.	43 25 20.1	+ 0.1
	16	β Herculis	9	25	11.01	+ 0.30	+ 13.33	17 3 48.00	+ 5 33.03	+ 19.4	16 25 24.57	.	68 16 1.6	- 0.3
22	17	Sun I, S.	9	4	31.86	- 0.54	+ 13.36	62 29 54.52	+ 4 54.45	+ 1 59.5	18 4 44.68	+ 71.26	113 43 9.7	.
	18	Sun II, N.	9	6	54.39	- 0.54	+ 13.36	61 57 56.50	+ 4 22.25	+ 1 56.8	18 7 7.21	- 71.27	113 10 36.8	.
	19	δ Aquilæ	9	19	38.49	- 0.05	+ 13.34	35 55 50.50	+ 3 23.63	+ 45.0	19 19 51.87	.	87 6 20.3	+ 0.2
	20	γ Aquilæ	9	40	43.19	+ 0.08	+ 13.47	28 27 55.02	+ 4 32.90	+ 33.7	19 40 56.72	.	79 39 22.8	+ 0.3
	21	α Aquilæ	9	45	6.30	+ 0.05	+ 13.49	30 13 51.52	+ 4 36.64	+ 36.2	19 45 19.80	.	81 25 25.6	- 0.6
	22	ϵ Delphini	9	27	38.94	+ 0.09	+ 13.52	27 53 53.22	+ 3 36.33	+ 32.8	20 27 52.52	.	79 4 23.6	+ 0.2
	23	ν Cygni	9	52	45.88	+ 0.75	+ 13.52	358 5 48.90	+ 3 21.09	- 2.0	20 53 0.15	.	49 15 29.2	+ 0.3
	24	Venus I, N.	6	57	58.68	- 0.45	+ 13.52	58 1 53.82	+ 5 3.80	+ 1 39.0	20 58 11.75	+ 0.55	109 14 57.8	.
	25	Venus II, S.	5	57	59.52	- 0.45	+ 13.52	58 1 53.82	+ 5 20.63	+ 1 39.1	20 58 12.59	- 0.29	109 15 14.7	.
	26	ϵ Piscium	9	56	56.49	+ 0.03	+ 13.68	31 31 53.68	+ 3 39.89	+ 38.2	0 57 10.19	.	82 42 33.0	+ 0.1
	27	β Andromedæ	9	3	16.17	+ 0.60	+ 13.77	3 47 53.40	+ 3 42.72	+ 4.2	1 3 30.44	.	54 58 1.5	- 0.4
	28	Polaris	7	17	32.41	+ 43.58	+ 13.68	310 7 54.85	+ 3 46.75	- 1 13.6	1 18 29.67	.	1 16 49.2	+ 0.4
	29	η Piscium	9	25	18.22	+ 0.17	+ 13.68	24 1 54.42	+ 4 55.17	+ 27.9	1 25 32.07	.	75 13 38.7	- 0.3
	30	θ Piscium	9	39	17.69	- 0.06	+ 13.69	30 13 52.02	+ 3 21.11	+ 36.4	1 39 31.44	.	81 24 10.7	+ 0.4
	31	β Arietis	9	48	16.09	+ 0.28	+ 13.70	18 34 . . .	.	.	1 48 30.06	.	69 44 . .	.
	32	B. A. C. 588	9	51	11.87	+ 1.94	+ 13.69	334 43 54.52	+ 5 14.50	- 29.3	1 51 27.50	- 4.75	25 55 0.9	+ 26.2
	33	ξ^2 Ceti	9	22	1.47	+ 0.05	+ 13.65	30 51 52.92	+ 3 31.48	+ 37.4	2 22 15.23	.	82 2 23.0	+ 0.6
	34	B. A. C. 784	9	31	33.87	+ 6.09	+ 13.71	317 51 51.82	+ 3 59.63	- 56.4	2 31 53.67	- 11.93	9 1 16.2	+ 24.2
	35	γ^2 Ceti	9	37	19.09	- 0.04	+ 13.65	36 1 56.58	+ 5 1.58	+ 45.6	2 37 32.77	.	87 14 5.0	+ 0.9
	36	Lalande 5221	9	44	1.33	+ 0.95	+ 13.72	352 25 52.62	+ 4 53.17	- 8.2	2 44 16.00	- 4.11	43 36 58.8	+ 18.6
	37	ϵ Tauri	9	21	54.22	+ 0.25	+ 13.76	19 53 56.05	+ 3 23.23	+ 22.8	4 22 8.24	.	71 4 3.3	0.0
	38	τ Tauri	9	35	20.97	+ 0.32	+ 13.85	16 3 54.70	+ 4 53.68	+ 18.2	4 35 35.07	.	67 15 27.8	- 0.3
	39	ι Aurigæ	9	49	31.79	+ 0.55	+ 13.83	5 49 55.58	+ 4 17.46	+ 6.5	4 49 46.12	.	57 0 40.7	+ 0.4
	40	β Eridani	9	2	10.27	- 0.19	+ 13.79	44 1 56.38	+ 4 37.77	+ 1 0.8	5 2 23.87	.	95 13 56.2	- 0.2
	41	α Leporis	9	27	37.23	- 0.42	+ 13.76	56 41 57.25	+ 4 20.13	+ 1 35.5	5 27 50.61	.	107 54 14.1	- 0.6
	42	κ Orionis	9	42	16.42	- 0.27	+ 13.75	48 29 51.00	+ 5 15.95	+ 1 11.0	5 42 29.96	.	99 42 39.2	- 0.9
23, E.	43	β Herculis	9	25	9.62	+ 0.27	+ 14.79	17 4 0.05	+ 5 21.29	+ 19.0	16 25 24.60	.	68 16 1.5	- 0.9
	44	ζ Ophiuchi	9	30	46.08	- 0.30	+ 14.69	49 7 50.38	+ 5 0.81	+ 1 11.0	16 31 0.49	.	100 20 23.4	+ 0.8
	45	η Herculis	9	38	47.67	+ 0.68	+ 14.68	359 41 54.05	+ 3 44.19	- 0.3	16 39 3.07	.	50 51 59.1	+ 0.9
	46	κ Ophiuchi	9	52	7.82	+ 0.05	+ 14.72	29 15 57.18	+ 4 10.10	+ 34.4	16 52 22.61	.	80 27 2.9	+ 0.4
24	47	ϵ Ursæ Minoris	9	56	52.00	+ 7.14	+ 14.75	316 37 57.18	+ 3 33.17	- 57.5	16 57 13.89	.	7 46 54.1	+ 0.8
	48	Sun I, N.	9	13	23.61	- 0.54	+ 14.84	61 55 57.75	+ 4 7.56	+ 1 53.1	18 13 37.91	+ 71.26	113 8 19.6	.
	49	Sun II, S.	9	15	46.13	- 0.54	+ 14.84	62 27 59.58	+ 4 39.23	+ 1 55.7	18 16 0.43	- 71.26	113 40 55.7	.
	50	γ Cygni	9	17	56.88	+ 0.70	+ 15.01	358 55 56.45	+ 3 33.40	- 1.1	20 18 12.58	.	50 5 49.9	+ 1.7
For summary of the constants of reduction, see page B. 3														
No.	Barom.	At. Ther.	Ex. Ther.					Numbers	Zenith-point Correction	No.	Parallax	Semi-diameter	Corr. for Def. Illum.	Sum
	in.	°	°						"		' "	' "	"	' "
7	30.03	30.2	27.8	6. One bisection.				1 to 12	+ 53.93	12	- 0.1	.	.	- 0.1
12	30.09	28.5	26.3	47. Three bisections.				13 to 25	+ 51.93	17	- 8.0	- 16 16.4	.	- 16 24.4
13	30.43	21.2	19.9	12. Four bisections.				26 to 42	+ 53.00	18	- 7.9	+ 16 16.4	.	+ 16 8.5
16	30.45	23.2	21.8					43 to 50	+ 52.90	24	- 6.8	+ 8.5	- 0.2	+ 1.5
18	30.43	26.0	25.2							25	- 6.8	- 8.6	.	- 15.4
19	30.43	27.6	27.4							48	- 7.9	+ 16 18.0	.	+ 16 10.1
25	30.44	29.5	29.0							49	- 8.0	- 16 18.0	.	- 16 26.0
26	30.45	27.0	26.1											
33	30.47	26.0	24.0											
38	30.48	25.8	22.5											
42	30.47	24.5	22.2											
43	30.35	31.0	30.5											
49	30.30	36.1	38.0											

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 24, E.					m. s.	s.	s.	° / //	/ //	/ //	h. m. s.	s.	° / //	//
	1	a Delphini	9	34 11.77	+ 0.16	+ 14.96	23 17 52.48	+ 4 2.53	+ 25.8	20 34 26.95	. .	74 28 42.0	- 1.6	
	2	ε Cygni	9	41 25.61	+ 0.53	+ 15.07	5 15 58.02	+ 4 13.02	+ 5.6	20 41 41.16	. .	56 26 37.8	- 0.4	
	3	Venus I, S.	9	7 37.38	- 0.44	+ 15.06	57 19 56.18	+ 4 17.13	+ 1 32.9	21 7 52.00	+ 0.55	108 32 7.4	. .	
	4	Polaris	5	17 19.74	+ 52.77	+ 15.22	310 8 . .		. .	1 18 27.73	. .	1 17 . .	. .	
	5	o Piscium	9	39 16.26	- 0.08	+ 15.24	30 14 . .		. .	1 39 31.41	. .	81 24 . .	. .	
	6	ζ Ceti	8	45 43.59	- 0.49	+ 15.29	49 42 . .		. .	1 45 58.34	. .	100 53 . .	. .	
	7	β Arietis	9	48 14.70	+ 0.18	+ 15.17	18 34 . .		. .	1 48 30.12	. .	69 44 . .	. .	
	8	γ ¹ Andromedæ	9	56 49.00	+ 0.80	+ 15.17	357 2 . .		. .	1 57 5.04	. .	48 12 . .	. .	
	9	β Trianguli	9	2 40.27	+ 0.55	+ 15.29	4 22 . .		. .	2 2 56.07	. .	55 32 . .	. .	
	10	ξ ² Ceti	9	21 59.96	- 0.10	+ 15.29	30 52 . .		. .	2 22 15.12	. .	82 2 . .	. .	
	11	δ Ceti	9	33 32.33	- 0.26	+ 15.28	38 58 . .		. .	2 33 47.33	. .	90 9 . .	. .	
	12	γ ² Ceti	9	37 17.62	- 0.20	+ 15.27	36 2 . .		. .	2 37 32.68	. .	87 14 . .	. .	
	13	α Ceti	9	56 13.37	- 0.19	+ 15.28	35 10 . .		. .	2 56 28.45	. .	86 21 . .	. .	
	14	β Persei	9	0 40.91	+ 0.75	+ 15.20	358 18 . .		. .	3 0 56.94	. .	49 28 . .	. .	
	15	f Tauri	9	24 29.34	0.00	+ 15.28	26 16 . .		. .	3 24 44.63	. .	77 27 . .	. .	
	16	ε Eridani	9	27 27.20	- 0.47	+ 15.35	48 38 . .		. .	3 27 42.02	. .	99 50 . .	. .	
17	ζ Persei	9	46 53.64	+ 0.47	+ 15.30	7 16 . .		. .	3 47 9.41	. .	58 27 . .	. .		
27, E.	18	τ Herculis	9	16 4.49	+ 0.92	+ 16.51	352 13 53.70	+ 5 15.09	- 8.1	16 16 21.99	. .	43 25 21.9	- 0.2	
28	19	β Herculis	9	25 7.76	+ 0.40	+ 16.60	17 3 52.05	+ 5 31.72	+ 18.5	16 25 24.75	. .	68 16 3.5	0.0	
	20	α Ophiuchi	9	29 27.72	+ 0.26	+ 16.69	26 9 54.45	+ 4 43.35	+ 29.6	17 29 44.57	. .	77 21 28.6	0.0	
	21	Sun I, S.	9	31 6.61	- 0.25	+ 16.67	62 17 52.30	+ 4 44.37	+ 1 53.9	18 31 23.03	+ 71.33	113 30 51.8	. .	
	22	Sun II, N.	9	33 28.08	- 0.25	+ 16.67	61 45 54.15	+ 4 11.66	+ 1 51.4	18 33 45.70	- 71.34	112 58 18.4	. .	
	23	θ Aquilæ	9	5 15.64	+ 0.06	+ 16.68	39 57 57.35	+ 3 53.36	+ 50.2	20 5 32.43	. .	91 9 2.1	- 0.3	
	24	γ Cygni	9	17 55.04	+ 0.74	+ 16.78	358 55 52.80	+ 3 37.45	- 1.1	20 18 12.52	. .	50 5 50.3	+ 1.0	
	25	α Delphini	3	34 9.87	+ 0.30	+ 16.72	23 17 55.65	+ 4 0.50	+ 25.8	20 34 26.92	. .	74 28 43.2	- 1.2	
	26	ε Cygni	9	41 23.79	+ 0.60	+ 16.80	5 15 54.65	+ 4 17.89	+ 5.6	20 41 41.14	. .	56 26 39.3	+ 0.2	
	27	ν Cygni	9	52 42.56	+ 0.76	+ 16.77	358 5 52.60	+ 3 18.64	- 1.9	20 53 0.08	. .	49 15 30.5	+ 0.2	
	28	ζ Cygni	9	7 53.50	+ 0.53	+ 16.76	9 3 53.08	+ 3 14.25	+ 9.6	21 8 10.80	. .	60 13 38.1	+ 0.2	
	29	Venus I, S.	9	26 36.17	- 0.16	+ 16.78	55 47 49.60	+ 4 33.84	+ 1 27.8	21 26 52.79	+ 0.56	107 0 12.4	. .	
	30	Weisse (2) 20	9	4 0.10	+ 0.42	+ 16.83	13 55 52.78	+ 5 20.93	+ 15.2	1 4 17.35	- 2.54	65 7 50.1	+ 19.4	
	31	B. A. C. 363	9	7 54.97	+ 2.35	+ 16.84	327 39 51.25	+ 4 54.42	- 38.3	1 8 14.16	- 4.32	18 50 28.6	+ 30.5	
32	Polaris	7	17 32.30	+ 35.06	+ 16.84	310 7 51.22	+ 3 49.81	- 1 11.9	1 18 24.20	. .	1 16 50.3	+ 2.3		
33	η Piscium	9	25 14.88	+ 0.26	+ 16.86	24 1 49.70	+ 5 1.84	+ 27.2	1 25 31.99	. .	75 13 39.9	+ 0.6		
34	o Piscium	9	39 14.33	+ 0.17	+ 16.88	30 13 50.62	+ 3 22.66	+ 35.5	1 39 31.36	. .	81 24 10.0	- 0.6		
35	ζ Ceti	9	45 41.54	- 0.10	+ 16.90	49 41 53.18	+ 3 48.13	+ 1 11.8	1 45 58.30	. .	100 53 14.3	- 2.6		
36	β Arietis	9	48 12.83	+ 0.34	+ 16.84	18 33 47.65	+ 3 37.28	+ 20.5	1 48 30.04	. .	69 44 6.6	- 0.9		
37	γ ¹ Andromedæ	9	56 47.36	+ 0.75	+ 16.80	357 1 47.52	+ 4 2.72	- 3.1	1 57 4.98	. .	48 12 8.3	+ 0.5		
38	β Trianguli	9	2 38.56	+ 0.59	+ 16.91	4 21 49.62	+ 3 59.45	+ 4.7	2 2 56.03	. .	55 32 15.0	- 0.2		
39	δ Persei	9	34 43.87	+ 0.91	+ 16.89	351 23 57.55	+ 3 52.30	- 9.2	3 35 1.73	. .	42 34 1.8	- 1.3		
40	η Tauri	9	40 35.83	+ 0.40	+ 16.96	15 3 51.38	+ 3 53.83	+ 16.5	3 40 53.18	. .	66 14 22.9	+ 0.8		
41	ζ Persei	9	46 51.89	+ 0.53	+ 16.97	7 15 50.95	+ 4 29.30	+ 7.9	3 47 9.38	. .	58 26 49.3	- 0.2		
42	Weisse (2) 1023	9	49 0.12	+ 0.64	+ 16.96	1 59 50.75	+ 3 50.75	+ 2.2	3 49 17.72	- 4.06	53 10 4.9	+ 11.0		
43	Weisse (2) 1064	9	51 3.48	+ 0.64	+ 16.96	1 59 50.75	+ 5 2.94	+ 2.2	3 51 21.08	- 4.07	53 11 17.1	+ 10.7		
44	D. M. + 36°, 804	9	53 37.91	+ 0.64	+ 16.96	1 59 50.75	+ 5 2.79	+ 2.2	3 53 55.51	- 4.08	53 11 16.9	+ 10.5		
45	Lalande 7419	9	55 34.44	+ 0.64	+ 16.96	1 59 50.75	+ 5 8.61	+ 2.2	3 55 52.04	- 4.09	53 11 22.8	+ 10.3		
46	Lalande 7466	9	57 22.30	+ 0.64	+ 16.96	1 59 50.75	+ 6 46.43	+ 2.3	3 57 39.90	- 4.10	53 13 0.7	+ 10.1		
47	Weisse (2) 1248	9	0 10.66	+ 0.64	+ 16.97	1 59 50.75	+ 5 45.99	+ 2.2	4 0 28.27	- 4.12	53 12 0.1	+ 9.8		
48	γ Tauri	9	13 11.47	+ 0.27	+ 16.98	23 27 52.20	+ 3 52.34	+ 26.6	4 13 28.72	. .	74 38 32.3	0.0		
49	ε Tauri	9	21 50.94	+ 0.32	+ 16.97	19 53 49.62	+ 3 31.23	+ 22.2	4 22 8.24	. .	71 4 4.2	+ 0.9		
50	τ Tauri	9	35 17.78	+ 0.38	+ 16.99	16 3 50.48	+ 4 58.15	+ 17.7	4 35 35.15	. .	67 15 27.5	- 0.5		

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3	Numbers	Zenith-point (Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum							
	in.	°	°			//		/ //	/ //	//	/ //							
3	30.28	44.0	44.0	42, 43, 44, 45, 46, 47.	1 to 3	+ 52.90	3	— 6.8	— 7.8	.	— 14.6							
4	30.27	36.0	33.0															
17	30.26	33.0	30.0	31, 32.	18 to 29	+ 55.29	21	— 8.0	— 16 16.7	.	— 16 24.7							
18	30.13	38.0	37.5															
22	30.14	40.0	39.5	1, 2, 3.	30 to 50	+ 54.86	22	— 7.9	+ 16 16.7	.	+ 16 8.8							
29	30.16	42.0	41.2															
32	30.23	36.0	33.0															
							29	— 6.8	— 8.0	.	— 14.8							

DATE AND OBS'R	Number	OBJECT	Magnitude	Threads	MEAN THREAD	CORRECTIONS		ZENITH DIST. SOUTH FROM CIRCLES	CORRECTIONS		APPARENT RIGHT ASCENSION	Miscellaneous Correction	APPARENT NORTH-POLAR DISTANCE	Miscellaneous Correction
						Inst.	Clock		Instrument	Refraction				
Dec. 28, E.	1	ι Aurigæ		9	m. s. 49 28.58	s. + 0.56	+ 17.05	° ' "	' "	' "	h. m. s. 4 49 46.14	s. . .	° ' "	' "
W.	2	Moon II		9	25 26.22	— 0.27	+ 17.26	53 38 . .	. . .	. . .	15 25 43.21	—70.81	104 0 . .	. .
	3	α Coronæ Borealis		9	29 39.69	+ 0.41	+ 17.26	11 43 56.12	+ 4 10.37	+ 13.0	15 29 57.36	. .	62 54 40.7	— 0.9
	4	α Serpentis		9	38 28.74	+ 0.07	+ 17.27	32 1 57.65	+ 4 26.61	+ 38.8	15 38 46.07	. .	83 13 24.3	— 0.9
	5	ϵ Serpentis		9	44 57.70	+ 0.04	+ 17.26	33 59 57.22	+ 4 9.55	+ 41.8	15 45 15.01	. .	85 11 9.8	— 1.1
	6	Sun I, N. . . .		9	35 32.16	— 0.40	+ 17.34	61 41 51.15	+ 4 34.62	+ 1 51.8	18 35 49.10	+71.09	112 54 38.8	. .
29	7	Sun II, S. . . .		9	37 54.34	— 0.40	+ 17.34	62 13 51.32	+ 5 8.03	+ 1 54.3	18 38 11.28	—71.09	113 27 14.9	. .
	8	α Cygni		9	37 18.58	+ 0.83	+ 17.36	353 56 1.30	+ 4 36.34	— 6.3	20 37 36.81	. .	45 6 52.5	0.0
	9	ν Cygni		9	52 41.98	+ 0.71	+ 17.39	358 5 53.05	+ 3 18.36	— 1.9	20 53 0.10	. .	49 15 30.7	+ 0.1
	10	ζ Cygni		8	7 52.91	+ 0.46	+ 17.41	9 3 53.08	+ 3 15.58	+ 9.6	21 8 10.78	. .	60 13 39.5	+ 1.4
	11	Venus I, S. . . .		9	31 16.86	— 0.29	+ 17.42	55 23 58.92	+ 4 20.68	+ 1 26.7	21 31 33.99	+ 0.56	106 36 7.5	. .
	12	ϵ Pegasi		9	38 24.64	+ 0.11	+ 17.48	29 25 57.00	+ 5 12.15	+ 33.8	21 38 42.18	. .	80 38 4.2	+ 1.4
	13	γ^2 Ceti		9	37 15.18	+ 0.02	+ 17.45	36 1 55.00	+ 5 3.35	+ 44.6	2 37 32.66	. .	87 14 4.2	— 0.4
	14	Lalande 5579		. .				335 11 54.60	+ 4 34.15	— 28.2	2 57.9 . .	. .	26 22 21.8	+20.9
	15	48 (H) Cephei		11	5 56.96	+ 3.89	+ 17.48	321 29 56.42	+ 4 50.52	— 48.6	3 6 18.33	. .	12 40 19.5	— 0.1
	16	Weisse (2) 320		9	17 15.17	+ 0.55	+ 17.49	5 39 54.30	+ 5 8.48	+ 6.2	3 17 33.21	— 3.72	56 51 30.2	+13.2
	17	γ^2 Ursæ Minoris, S.P. . . .		9	20 35.78	— 2.77	+ 17.49	291 5 51.20	+ 4 1.00	— 2 37.5	15 20 50.50	. .	342 13 35.9	— 0.6
	18	ϵ Eridani		9	27 24.73	— 0.18	+ 17.50	48 37 56.95	+ 4 46.98	+ 1 9.9	3 27 42.05	. .	99 50 15.0	+ 0.9
	19	δ Persei		9	34 43.26	+ 0.94	+ 17.46	351 23 54.68	+ 3 56.82	— 9.2	3 35 1.71	. .	42 34 3.5	+ 0.6
	20	η Tauri		9	40 35.29	+ 0.36	+ 17.53	15 3 49.82	+ 3 54.10	+ 16.6	3 40 53.17	. .	66 14 21.7	— 0.4
	21	ζ Persei		9	46 51.37	+ 0.52	+ 17.50	7 15 53.38	+ 4 26.21	+ 7.9	3 47 9.41	. .	58 26 48.7	— 0.7
	22	α^1 Eridani		9	6 9.51	— 0.14	+ 17.61	45 55 57.65	+ 4 25.72	+ 1 3.8	4 6 26.91	. .	97 7 48.4	— 0.4
	23	ι Aurigæ		9	49 28.06	+ 0.45	+ 17.68	5 49 57.52	+ 4 13.74	+ 6.4	4 49 46.09	. .	57 0 38.9	— 0.8
	24	ϵ Ursæ Minoris, S.P. . . .		9	57 2.50	— 6.46	+ 17.59	301 3 55.10	+ 4 31.01	— 1 41.9	16 57 13.63	. .	352 13 5.4	+ 0.9
25	β Eridani		9	2 6.38	— 0.11	+ 17.62	44 1 52.95	+ 4 44.11	+ 59.8	5 2 23.86	. .	95 13 58.1	+ 0.8	
26	Groombridge 966		9	24 35.41	+ 3.26	+ 17.62	323 52 . .			5 24 56.29	. .	15 2 . .	. .	
27	α Leporis		9	27 33.33	— 0.31	+ 17.58	56 41 55.62	+ 4 25.97	+ 1 34.1	5 27 50.64	. .	107 54 16.9	+ 0.8	
28	B. A. C. 1846		9	43 1.33	+ 0.17	+ 17.63	26 11 50.18	+ 4 26.50	+ 30.5	5 43 19.13	— 3.66	77 23 8.4	+ 2.7	
29	ν Orionis		9	0 56 54	+ 0.21	+ 17.68	24 1 56.60	+ 4 26.73	+ 27.7	6 1 14.40	. .	75 13 12.2	— 0.9	
30	η Geminorum		9	7 53.04	+ 0.34	+ 17.61	16 16 . .			6 8 11.04	. .	67 28 . .	. .	
31	δ Ursæ Minoris, S.P. . . .		3	7 47.80	—14.89	+ 17.66	305 27 54.25	+ 3 53.90	— 1 26.5	18 7 50.57	. .	356 36 42.9	+ 0.5	
32	μ Geminorum		9	15 57.04	+ 0.34	+ 17.68	16 13 51.80	+ 5 22.88	+ 18.1	6 16 15.04	. .	67 25 54.0	+ 0.8	
33	γ Geminorum		9	31 0.46	+ 0.24	+ 17.59	22 19 52.95	+ 3 47.60	+ 25.5	6 31 18.38	. .	73 30 27.3	— 1.2	

No.	Barom.	At. Ther.	Ex. Ther.	For summary of the constants of reduction, see page B.3	Numbers	Zenith-point Correction	No.	Parallax	Semi- diameter	Corr. for Def. Illum.	Sum	
	in.	°	°			"		' "	' "	"	' "	
1	30.24	33.5	30.0	25, 27. One bisection.	1	+ 54.86	6	— 7.9	+16 18.0	.	+16 10.1	
4	30.38	28.8	26.3		3 to 12	+ 54.69	7	— 8.0	—16 18.0	.	—16 26.0	
7	30.40	38.1	40.7	24. Three bisections.	13 to 33	+ 54.56	11	— 6.8	— 8.0	.	— 14.8	
8	30.40	41.9	44.4	11. Four bisections.								
12	30.41	43.9	44.4									
13	30.44	35.3	33.3									
22	30.45	32.8	30.3									
33	30.46	31.4	27.8									

MERIDIAN TRANSIT TIME-OBSERVATIONS 1888

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Jan. 2.2	Groom. 4163 . . .	5	23 50 12.09	— 2.66	— 46.30	Jan. 18.2	ϵ Piscium	11	0 57 53.80	+ 0.41	— 47.23
L. C. H.	ω Piscium	11	23 54 18.84	+ 0.62	— 46.85	B. W. H.	β Andromedæ . .	11	1 4 14.48	— 0.13	— 47.28
	33 Piscium	11	0 0 20.97	+ 0.88	— 46.75		f Piscium	11	1 12 47.41	+ 0.49	— 47.40
	4 (H) Draconis, S.P.	5	0 7 36.68	+ 4.92	— 46.32		v Piscium	13	1 14 5.36	+ 0.05	— 47.42
	σ Andromedæ . .	11	0 13 14.85	— 0.05	— 46.85		a Ursæ Minoris .	5	1 19 13.89	— 36.46	— 46.86
	44 Piscium	11	0 20 24.78	+ 0.72	— 46.75		Groom. 2001, S.P.	5	1 23 59.28	+ 3.00	— 46.71
	12 Ceti	11	0 25 4.35	+ 0.84	— 46.73		η Piscium	11	1 26 15.84	+ 0.27	— 47.33
							π Piscium	11	1 31 55.95	+ 0.33	— 47.25
Jan. 3.3	ξ Piscium	11	1 48 30.72	+ 0.95	— 46.62	Jan. 19.2	Groom. 2001, S.P.	5	1 23 59.76	+ 3.34	— 47.45
L. C. H.	50 Cassiopeæ . . .	5	1 54 42.91	— 2.08	— 46.82	B. W. H.	π Piscium	13	1 31 56.14	+ 0.37	— 47.50
	a Arietis	11	2 1 37.65	+ 0.53	— 46.77		v Piscium	11	1 36 22.41	+ 0.49	— 47.39
	β Trianguli . . .	11	2 3 39.31	+ 0.24	— 46.81		o Piscium	11	1 40 15.12	+ 0.42	— 47.38
	ξ^1 Ceti	11	2 7 49.45	— 0.83	— 46.69		a Trianguli . . .	11	1 47 28.85	+ 0.02	— 47.45
	4 Ursæ Min., S.P.	5	2 9 55.39	+ 5.18	— 46.85		β Arietis	11	1 49 13.86	+ 0.20	— 47.38
	o Ceti	11	2 14 26.70	+ 1.07	— 46.75						
	ξ^2 Ceti	11	2 22 57.90	+ 0.84	— 46.65	Jan. 21.2	β Andromedæ . .	11	1 4 15.30	— 0.27	— 48.01
Jan. 10.2	a Andromedæ . .	11	0 3 21.05	+ 0.30	— 46.33	B. W. H.	v Piscium	11	1 14 0.07	— 0.07	— 48.05
L. C. H.	γ Pegasi	11	0 8 12.96	+ 0.60	— 46.41		Groom. 2001, S.P.	5	1 24 0.65	+ 3.16	— 47.99
	44 Piscium	11	0 20 24.45	+ 0.86	— 46.66		η Piscium	11	1 26 16.64	+ 0.16	— 48.06
	12 Ceti	11	0 25 3.99	+ 0.98	— 46.61		π Piscium	11	1 31 56.84	+ 0.22	— 48.06
	π Andromedæ . .	11	0 31 39.40	+ 0.18	— 46.35		v Piscium	11	1 36 23.01	+ 0.34	— 47.86
	δ Andromedæ . .	11	0 34 5.65	+ 0.25	— 46.23	Jan. 24.2	v Piscium	11	1 14 6.38	— 0.03	— 48.45
	21 Cassiopeæ . . .	5	0 39 4.70	— 2.63	— 46.69	B. W. H.	a Ursæ Minoris .	5	1 19 13.54	— 40.39	— 48.03
	δ Piscium	11	0 43 37.34	+ 0.74	— 46.62		η Piscium	11	1 26 16.98	+ 0.21	— 48.50
	32 ² (H) Camelop., S.P.	5	0 48 53.28	+ 9.52	— 46.74		π Piscium	11	1 31 57.23	+ 0.27	— 48.55
Jan. 11.3	ξ^2 Ceti	11	2 22 57.96	+ 0.47	— 46.42		v Piscium	11	1 36 23.43	+ 0.39	— 48.37
L. C. H.	5 Ursæ Min., S.P.	5	2 28 25.59	+ 3.89	— 46.33		o Piscium	11	1 40 16.14	+ 0.33	— 48.37
	v Arietis	11	2 33 13.37	+ 0.19	— 46.30		ζ Ceti	8	1 46 42.68	+ 0.70	— 48.20
	41 Arietis	11	2 44 9.73	+ 0.07	— 46.37		a Trianguli . . .	11	1 47 29.80	— 0.09	— 48.38
	σ Arietis	11	2 46 4.58	+ 0.33	— 46.47		β Arietis	11	1 49 14.90	+ 0.10	— 48.39
	47 (H) Cephei . .	5	2 52 6.92	— 4.15	— 46.31	Jan. 26.3	o Tauri	11	3 19 35.80	+ 0.62	— 49.41
	δ Arietis	11	3 5 59.85	+ 0.23	— 46.60	L. C. H.	f Tauri	11	3 25 30.13	+ 0.52	— 49.40
	ξ Arietis	11	3 9 14.34	+ 0.22	— 46.70		5 (H) Camelop. .	5	3 39 26.00	— 2.70	— 49.65
Jan. 14.2	π Andromedæ . .	11	0 31 39.78	+ 0.22	— 46.84		η Tauri	11	3 41 38.95	+ 0.24	— 49.58
L. C. H.	δ Andromedæ . .	11	0 34 6.10	+ 0.29	— 46.79		ζ Ursæ Min., S.P.	5	3 48 44.93	+ 6.04	— 49.68
	δ Piscium	11	0 43 37.61	+ 0.75	— 46.95		ξ Persei	11	3 52 31.69	— 0.11	— 49.55
	32 ² (H) Camelop., S.P.	5	0 48 54.88	+ 9.04	— 46.97		λ Tauri	11	3 55 17.64	+ 0.54	— 49.64
	43 (H) Cephei . .	5	0 54 32.75	— 10.84	— 46.94		v Tauri	11	3 58 0.90	+ 0.69	— 49.64
	ϵ Piscium	11	0 57 53.19	+ 0.75	— 46.91	Jan. 27.3	λ Tauri	11	3 55 17.85	+ 0.40	— 49.72
	β Andromedæ . .	11	1 4 13.80	+ 0.18	— 46.83	L. C. H.	v Tauri	11	3 58 1.19	+ 0.52	— 49.77
	f Piscium	11	1 12 46.63	+ 0.83	— 46.91		Groom. 750 . . .	5	4 2 45.07	— 9.50	— 50.10
	v Piscium	13	1 14 4.59	+ 0.37	— 46.91		o^1 Eridani	11	4 7 13.08	+ 0.76	— 49.85
Jan. 16.3	δ Ceti	11	2 34 30.33	+ 0.82	— 46.92		γ Tauri	11	4 14 14.69	+ 0.34	— 49.71
B. W. H.	γ Ceti	11	2 38 15.76	+ 0.75	— 46.96		δ Tauri	11	4 17 18.09	+ 0.31	— 49.72
	μ Ceti	11	2 39 39.36	+ 0.58	— 46.97		η Ursæ Min., S.P.	5	4 21 30.44	+ 3.68	— 50.11
	41 Arietis	11	2 44 9.87	+ 0.26	— 46.77		ϵ Tauri	11	4 22 54.42	+ 0.28	— 49.93
	σ Arietis	11	2 46 4.86	+ 0.47	— 46.96	Jan. 28.2	a Trianguli . . .	11	1 47 31.21	+ 0.04	— 49.99
	a Ceti	11	2 57 11.60	+ 0.73	— 47.01		β Arietis	11	1 49 16.27	+ 0.27	— 49.99
	ρ Persei	11	2 58 47.25	— 0.18	— 47.01		50 Cassiopeæ . .	5	1 54 45.38	— 2.97	— 49.91
	β Persei	11	3 1 40.49	— 0.25	— 47.19		a Arietis	11	2 1 41.07	+ 0.21	— 50.23
	48 (H) Cephei . .	8	3 7 1.13	— 4.21	— 46.92		β Trianguli . . .	11	2 3 42.67	— 0.14	— 50.21
							ξ^1 Ceti	11	2 7 52.88	+ 0.56	— 50.18
							4 Ursæ Min., S.P.	5	2 10 0.40	+ 6.05	— 49.91
							o Ceti	10	2 14 30.11	+ 0.85	— 50.27

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Jan. 30.3	ζ Ursæ Min., S. P.	5	3 46 40.32	+ 5.63	+ 75.76	Feb. 17.3	i Tauri	11	4 45 6.19	+ 0.77	— 17.65
B. W. H.	ϵ Persei	11	3 49 4.70	— 0.08	+ 75.75	B. W. H.	π^5 Orionis	13	4 48 41.24	+ 1.10	— 17.31
	ξ Persei	13	3 50 26.07	+ 0.05	+ 75.84		ι Tauri	11	4 56 40.90	+ 0.72	— 17.52
	λ Tauri	13	3 53 12.01	+ 0.62	+ 75.76		ϵ Ursæ Min., S. P.	5	4 57 36.00	+ 7.41	— 18.01
	ν Tauri	11	3 55 55.37	+ 0.76	+ 75.77		11 Orionis	13	4 58 26.92	+ 0.65	— 17.60
	A ¹ Tauri	8	3 56 48.17	+ 0.41	+ 75.92		19 (H) Camelop.	5	5 4 29.81	— 3.62	— 18.06
	Groom. 750	5	4 0 40.80	— 11.84	+ 75.76		μ Aurigæ	13	5 6 3.28	+ 0.33	— 17.64
	γ Tauri	11	4 12 8.88	+ 0.55	+ 75.85						
	δ Tauri	11	4 15 12.34	+ 0.52	+ 75.78	Feb. 18.3	τ Tauri	13	4 35 49.07	+ 0.66	— 18.45
Feb. 1.3	ζ Ursæ Min., S. P.	5	3 46 58.60	+ 5.55	— 2.23	B. W. H.	i Tauri	11	4 45 7.01	+ 0.74	— 18.46
B. W. H.	ν Tauri	11	3 57 13.62	+ 0.73	— 2.48		π^5 Orionis	11	4 48 42.39	+ 1.04	— 18.41
	A ¹ Tauri	8	3 58 6.58	+ 0.39	— 2.50		ι Aurigæ	11	4 49 59.81	+ 0.45	— 18.23
	Groom. 750	5	4 1 58.16	— 11.70	— 2.25		ι Tauri	11	4 56 41.85	+ 0.69	— 18.46
	γ Tauri	11	4 13 27.42	+ 0.53	— 2.70		ϵ Ursæ Min., S. P.	5	4 57 36.76	+ 7.07	— 18.28
	δ Tauri	11	4 16 30.75	+ 0.49	— 2.63		11 Orionis	11	4 58 27.86	+ 0.82	— 18.52
	ϵ Tauri	11	4 22 6.82	+ 0.45	— 2.57		19 (H) Camelop.	5	5 4 29.82	— 3.46	— 18.32
	α Tauri	11	4 29 31.73	+ 0.51	— 2.47	Feb. 22.3	i Tauri	11	4 45 8.71	+ 0.78	— 20.26
	τ Tauri	11	4 35 33.91	+ 0.36	— 2.73	L. C. H.	π^5 Orionis	11	4 48 44.11	+ 1.11	— 20.26
Feb. 2.3	η Tauri	11	3 40 56.48	+ 0.45	— 7.43		ι Aurigæ	8	4 50 1.74	+ 0.46	— 20.25
B. W. H.	ζ Ursæ Min., S. P.	5	3 48 2.38	+ 6.03	— 6.38		ϵ Ursæ Min., S. P.	5	4 57 46.43	+ 7.87	— 20.24
	ϵ Persei	11	3 50 27.84	0.00	— 7.53		11 Orionis	11	4 58 29.67	+ 0.86	— 20.44
	ξ Persei	8	3 51 49.32	+ 0.13	— 7.54		19 (H) Camelop.	5	5 4 31.74	— 3.88	— 20.23
	λ Tauri	11	3 54 35.05	+ 0.73	— 7.33		μ Aurigæ	8	5 6 5.98	+ 0.32	— 20.42
	ν Tauri	13	3 57 18.32	+ 0.87	— 7.33		β Tauri	11	5 19 32.58	+ 0.58	— 20.36
	A ¹ Tauri	13	3 58 11.21	+ 0.51	— 7.26	Feb. 23.3	τ Tauri	11	4 35 51.96	+ 0.63	— 21.41
	Groom. 750	5	4 2 2.71	— 12.37	— 6.39	L. C. H.	i Tauri	11	4 45 9.89	+ 0.71	— 21.39
Feb. 3.4	ζ Draconis, S. P.	5	5 8 31.58	+ 2.42	— 8.23		π^5 Orionis	11	4 48 45.24	+ 1.05	— 21.35
B. W. H.	τ Orionis	11	5 12 17.24	+ 0.91	— 7.73		ι Aurigæ	8	4 50 2.88	+ 0.39	— 21.34
	β Tauri	8	5 19 20.57	+ 0.27	— 7.73		ι Tauri	11	4 56 44.76	+ 0.66	— 21.42
	δ Orionis	11	5 26 24.44	+ 0.79	— 7.76		ϵ Ursæ Min., S. P.	5	4 57 39.81	+ 0.79	— 21.37
	ϵ Orionis	13	5 30 39.14	+ 0.82	— 7.76		11 Orionis	11	4 58 30.65	+ 7.91	— 21.37
	ζ Tauri	8	5 31 4.89	+ 0.42	— 7.86		19 (H) Camelop.	5	5 4 32.86	— 4.02	— 21.31
	ν Aurigæ	11	5 43 52.40	+ 0.01	— 8.23		μ Aurigæ	8	5 6 7.08	+ 0.25	— 21.47
	α Orionis	11	5 49 13.94	+ 0.66	— 7.65	Feb. 26.3	χ Aurigæ	11	5 25 50.31	+ 0.37	— 24.26
	θ Aurigæ	11	5 52 13.27	+ 0.07	— 7.69	B. W. H.	δ Orionis	8	5 26 40.26	+ 1.05	— 24.19
Feb. 8.3	λ Tauri	11	3 54 37.67	+ 0.53	— 9.84		ι Orionis	11	5 30 20.28	+ 1.16	— 24.12
L. C. H.	ν Tauri	11	3 57 20.90	+ 0.63	— 9.76		Groom. 944	4	5 26 47.99	— 10.13	— 24.15
	Groom. 750	5	4 2 1.07	— 8.45	— 9.95		ζ Tauri	8	5 31 20.66	+ 0.63	— 24.17
	α^1 Eridani	11	4 6 32.85	+ 0.84	— 9.88		κ Orionis	13	5 42 49.76	+ 1.23	— 24.20
	ν Tauri	11	4 13 34.41	+ 0.47	— 9.73		ν Aurigæ	11	5 44 7.97	+ 0.18	— 24.37
	δ Tauri	11	4 16 37.85	+ 0.45	— 9.79		α Orionis	13	5 49 29.85	+ 0.90	— 24.11
	η Ursæ Min., S. P.	5	4 20 51.48	+ 3.51	— 9.94		θ Aurigæ	11	5 52 29.28	+ 0.25	— 24.25
Feb. 13.3	i Tauri	11	4 45 3.22	+ 0.71	— 14.55		35 Draconis, S. P.	5	5 54 45.23	+ 4.88	— 24.20
B. W. H.	π^5 Orionis	11	4 48 38.61	+ 1.10	— 14.61	Feb. 27.3	α Orionis	11	5 49 31.16	+ 0.55	— 25.09
	ι Aurigæ	11	4 49 56.16	+ 0.34	— 14.37	B. W. H.	θ Orionis	11	5 52 30.41	— 0.16	— 24.99
	ι Tauri	11	4 56 38.11	+ 0.65	— 14.60		ν Orionis	10	6 1 25.58	+ 0.39	— 25.10
	ϵ Ursæ Min., S. P.	5	4 57 30.52	+ 9.07	— 14.82		22 (H) Camelop.	5	6 6 58.71	— 2.18	— 25.73
	11 Orionis	11	4 58 24.14	+ 0.81	— 14.71		δ Ursæ Min., S. P.	5	6 8 27.49	+ 17.87	— 25.74
	19 (H) Camelop.	5	5 4 28.15	— 4.78	— 14.84		η Geminorum	11	6 8 32.22	+ 0.21	— 25.16
Feb. 14.3	i Tauri	11	4 45 3.86	+ 0.76	— 15.26		μ Geminorum	11	6 16 36.24	+ 0.21	— 25.08
B. W. H.	π^5 Orionis	11	4 48 39.16	+ 1.04	— 15.12		8 Monocerotis	11	6 18 14.70	+ 0.60	— 25.01
	ι Aurigæ	11	4 49 56.80	+ 0.48	— 15.17	Feb. 28.3	α Orionis	11	5 49 31.76	+ 0.76	— 25.91
	ι Tauri	11	4 56 38.69	+ 0.71	— 15.25	B. W. H.	θ Aurigæ	11	5 52 31.15	— 0.12	— 25.79
	ϵ Ursæ Min., S. P.	5	4 57 33.54	+ 6.67	— 15.27		ν Orionis	11	6 1 35.97	+ 0.55	— 25.66
	11 Orionis	11	4 58 24.64	+ 0.83	— 15.25		22 (H) Camelop.	5	6 6 59.58	— 2.63	— 26.20
	19 (H) Camelop.	5	5 4 26.86	— 3.18	— 15.25		δ Ursæ Min., S. P.	5	6 8 23.75	+ 22.49	— 26.26
Feb. 15.3	η Tauri	11	3 41 4.98	+ 0.26	— 15.96		η Geminorum	13	6 8 32.90	+ 0.34	— 25.98
B. W. H.	ζ Ursæ Min.	5	3 48 14.78	+ 4.39	— 15.68		μ Geminorum	11	6 16 36.94	+ 0.34	— 25.92
	ϵ Persei	11	3 50 36.20	— 0.09	— 16.07		8 Monocerotis	11	6 18 15.38	+ 0.81	— 25.91
	ξ Persei	13	3 51 57.84	+ 0.01	— 16.20	Feb. 28.3	α Orionis	11	5 49 31.76	+ 0.76	— 25.91
	λ Tauri	11	3 54 43.84	+ 0.48	— 16.08	B. W. H.	θ Aurigæ	11	5 52 31.15	— 0.12	— 25.79
	ν Tauri	13	3 57 27.04	+ 0.59	— 15.97		ν Orionis	11	6 1 35.97	+ 0.55	— 25.66
	A ¹ Tauri	13	3 58 19.82	+ 0.31	— 15.88		22 (H) Camelop.	5	6 6 59.58	— 2.63	— 26.20
	Groom. 750	3	4 2 5.83	— 9.38	— 15.67		δ Ursæ Min., S. P.	5	6 8 23.75	+ 22.49	— 26.26
Feb. 16.3	i Tauri	11	4 45 5.35	+ 0.48	— 16.50		η Geminorum	13	6 8 32.90	+ 0.34	— 25.98
B. W. H.	π^5 Orionis	11	4 48 40.74	+ 0.79	— 16.48	Mar. 3.3	μ Geminorum	11	6 16 36.94	+ 0.34	— 25.92
	ι Aurigæ	13	4 49 58.23	+ 0.17	— 16.33	B. W. H.	8 Monocerotis	11	6 18 15.38	+ 0.81	— 25.91
	ι Tauri	11	4 56 40.34	+ 0.42	— 16.65		δ Ursæ Min., S. P.	5	6 8 32.49	+ 17.12	— 28.21
	ϵ Ursæ Min., S. P.	5	4 57 34.90	+ 7.06	— 16.72		μ Geminorum	11	6 16 39.15	+ 0.66	— 28.52
	11 Orionis	11	4 58 26.36	+ 0.55	— 16.72		8 Monocerotis	11	6 18 17.64	+ 1.03	— 28.46
	19 (H) Camelop.	5	5 4 28.88	— 3.89	— 16.76		ν Geminorum	11	6 22 46.79	+ 0.72	— 28.54
							γ Geminorum	11	6 31 42.45	+ 0.80	— 28.50
							S Monocerotis	11	6 35 16.43	+ 0.93	— 28.49
							ϵ Geminorum	11	6 37 30.70	+ 0.58	— 28.53
							ξ Geminorum	11	6 39 28.16	+ 0.88	— 28.57
							18 Monocerotis	11	6 42 28.98	+ 1.08	— 28.49
							51 (H) Cephei	5	6 48 41.18	— 18.85	— 28.11

*Clock changed.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888. Mar. 4.3 L. C. H.	δ Ursæ Min., s. p.	5	h. m. s. 6 8 32.41	s. + 18.77	s. — 29.46	1888. Mar. 17.3 B. W. H.	50 Draconis, s. p.	5	h. m. s. 6 50 35.20	s. + 4.20	s. — 41.40
	μ Geminorum	11	6 16 40.17	+ 0.49	— 29.39		ζ Geminorum	11	6 58 8.65	+ 0.64	— 41.14
	8 Monocerotis	11	6 18 18.63	+ 0.90	— 29.33		25 (H) Camelop.	5	7 8 17.77	— 5.92	— 41.43
	ν Geminorum	11	6 31 43.55	+ 0.65	— 29.46		λ Geminorum	11	7 12 19.94	+ 0.72	— 41.08
	S Monocerotis	11	6 35 17.54	+ 0.79	— 29.47		δ Geminorum	11	7 14 6.71	+ 0.62	— 41.08
	ϵ Geminorum	11	6 37 31.76	+ 0.43	— 29.46		ι Geminorum	11	7 19 27.06	+ 0.49	— 41.10
	ξ Geminorum	11	6 39 29.21	+ 0.73	— 29.48		β Canis Minoris	11	7 21 45.02	+ 0.88	— 41.00
	18 Monocerotis	11	6 42 30.01	+ 0.95	— 29.40		α^2 Geminorum	10	7 28 8.16	+ 0.40	— 40.99
	51 (H) Cephei	5	6 48 44.67	— 21.20	— 29.60						
Mar. 6.3 L. C. H.	δ Ursæ Min., s. p.	5	6 8 34.28	+ 19.20	— 31.13	Mar. 18.3 L. C. H.	63 Aurigæ	11	7 4 38.91	+ 0.27	— 41.93
	μ Geminorum	11	6 16 42.34	+ 0.26	— 31.37		25 (H) Camelop.	5	7 8 16.56	— 5.38	— 40.91
	8 Monocerotis	11	6 18 20.79	+ 0.67	— 31.30		λ Geminorum	11	7 12 20.76	+ 0.75	— 41.94
	ν Geminorum	11	6 31 45.75	+ 0.41	— 31.45		δ Geminorum	11	7 14 7.52	+ 0.65	— 41.93
	S Monocerotis	11	6 35 19.76	+ 0.56	— 31.49		ι Geminorum	11	7 19 27.85	+ 0.53	— 41.95
	ϵ Geminorum	11	6 37 34.06	+ 0.19	— 31.56		β Canis Minoris	11	7 21 45.93	+ 0.89	— 41.95
	ξ Geminorum	11	6 39 31.45	+ 0.50	— 31.52		α^2 Geminorum	11	7 28 9.04	+ 0.45	— 41.96
	18 Monocerotis	11	6 42 32.30	+ 0.72	— 31.49		λ Ursæ Min., s. p.	5	7 35 21.81	+ 45.40	— 40.88
	51 (H) Cephei	5	6 48 46.62	— 22.16	— 31.25		π Geminorum	11	7 40 58.95	+ 0.42	— 41.92
							ϕ Geminorum	11	7 47 20.35	+ 0.56	— 41.99
Mar. 7.3 L. C. H.	δ Ursæ Min., s. p.	5	6 8 36.74	+ 18.59	— 32.67	Mar. 21.3 L. C. H.	π Geminorum	11	7 41 0.44	+ 0.57	— 43.61
	μ Geminorum	11	6 16 42.96	+ 0.50	— 32.25		ϕ Geminorum	11	7 47 21.89	+ 0.71	— 43.73
	8 Monocerotis	11	6 18 21.50	+ 40.90	— 32.25		ω^1 Cancri	11	7 54 52.64	+ 0.75	— 43.78
	ν Geminorum	11	6 22 50.66	+ 0.57	— 32.33		χ Geminorum	11	7 57 21.75	+ 0.68	— 43.70
	γ Geminorum	11	6 31 46.32	+ 0.65	— 32.28		Bradley 1147	5	8 6 14.48	— 2.36	— 43.61
	S Monocerotis	11	6 35 20.31	+ 0.79	— 32.29		ζ^1 Cancri	11	8 6 30.52	+ 0.89	— 43.70
	ϵ Geminorum	11	6 37 34.53	+ 0.45	— 32.31		β Cancri	11	8 11 9.50	+ 1.04	— 43.64
	ξ Geminorum	11	6 39 31.96	+ 0.73	— 32.28		κ Cephei, s. p.	5	8 13 15.55	+ 4.78	— 43.68
	18 Monocerotis	11	6 42 32.85	+ 0.95	— 32.29						
	51 (H) Cephei	5	6 48 46.53	— 20.89	— 32.76	Mar. 22.3 L. C. H.	α^2 Geminorum	11	7 28 11.93	— 0.03	— 44.45
Mar. 8.3 L. C. H.	S Monocerotis	11	6 35 21.16	+ 0.81	— 33.17		λ Ursæ Min., s. p.	5	7 35 4.58	+ 69.91	— 44.18
	ϵ Geminorum	11	6 37 35.37	+ 0.49	— 33.21		π Geminorum	11	7 41 1.90	— 0.08	— 44.44
	ξ Geminorum	11	6 39 32.87	+ 0.75	— 33.22		ϕ Geminorum	11	7 47 23.20	+ 0.12	— 44.46
	18 Monocerotis	11	6 42 33.67	+ 0.95	— 33.12		ω^1 Cancri	11	7 54 53.85	+ 0.18	— 44.43
	51 (H) Cephei	5	6 48 45.04	— 18.90	— 33.61		λ Geminorum	11	7 57 23.18	+ 0.09	— 44.59
	ζ Geminorum	11	6 58 0.85	+ 0.58	— 33.17		Bradley 1147	5	8 6 17.04	— 4.41	— 44.19
	λ Geminorum	11	7 12 12.31	+ 0.67	— 33.24		ζ^1 Cancri	11	8 6 31.80	+ 0.39	— 44.49
	δ Geminorum	11	7 13 59.05	+ 0.56	— 33.20		β Cancri	11	8 11 10.76	+ 0.60	— 44.48
	τ Draconis, s. p.	5	7 18 10.06	+ 3.97	— 33.59	Mar. 29.3 B. W. H.	α^2 Geminorum	11	7 28 15.67	+ 0.54	— 48.90
Mar. 9.3 L. C. H.	ν Geminorum	11	6 22 52.39	+ 0.66	— 34.18		25 Monocerotis	11	7 32 30.32	+ 1.35	— 49.05
	γ Geminorum	11	6 31 47.99	+ 0.73	— 34.06		α Canis Minoris	11	7 34 14.25	+ 1.14	— 48.91
	S Monocerotis	11	6 35 22.04	+ 0.85	— 34.11		λ Ursæ Min., s. p.	4	7 35 27.96	+ 59.24	— 48.77
	ϵ Geminorum	11	6 37 36.29	+ 0.55	— 34.20		κ Geminorum	13	7 38 29.47	+ 0.71	— 48.93
	ξ Geminorum	11	6 39 33.69	+ 0.80	— 34.11		β Geminorum	8	7 39 16.10	+ 0.64	— 48.90
	18 Monocerotis	11	6 42 34.59	+ 0.98	— 34.09		π Geminorum	11	7 41 5.62	+ 0.49	— 48.88
	51 (H) Cephei	5	6 48 43.64	— 17.26	— 34.22		Groom. 1374	5	7 47 38.39	— 2.61	— 48.94
	50 Draconis, s. p.	5	6 50 27.40	+ 4.17	— 34.24		ω^1 Cancri	11	7 54 57.66	+ 0.71	— 48.89
	ζ Geminorum	11	6 58 1.78	+ 0.64	— 34.18		χ Geminorum	11	7 57 26.78	+ 0.64	— 48.87
Mar. 12.3 B. W. H.	S Monocerotis	11	6 35 25.34	+ 0.73	— 37.34	Mar. 30.3 B. W. H.	α^2 Geminorum	11	7 28 15.73	+ 0.80	— 49.24
	ϵ Geminorum	11	6 37 39.60	+ 0.29	— 37.31		25 Monocerotis	11	7 32 30.55	+ 1.42	— 49.37
	ξ Geminorum	11	6 39 37.05	+ 0.56	— 37.28		λ Ursæ Min., s. p.	4	7 35 46.16	+ 89.21	— 49.62
	18 Monocerotis	11	6 42 37.70	+ 0.91	— 37.18		π Geminorum	11	7 41 5.75	+ 0.77	— 49.31
	θ Geminorum	11	6 46 1.92	+ 0.07	— 37.36		ϕ Geminorum	11	7 47 27.10	+ 0.90	— 49.29
	51 (H) Cephei	5	6 48 34.15	— 25.04	— 38.24		Groom. 1374	5	7 47 37.77	— 1.59	— 49.41
	50 Draconis, s. p.	5	6 50 30.21	+ 5.54	— 38.18		ω^1 Cancri	11	7 54 57.79	+ 0.94	— 49.27
Mar. 14.3 B. W. H.	50 Draconis, s. p.	5	6 50 32.44	+ 4.20	— 38.90	Mar. 31.4	χ Geminorum	11	7 57 26.98	+ 0.88	— 49.33
	ζ Geminorum	11	6 58 6.61	+ 0.65	— 39.06		γ^1 Leonis	11	10 14 39.45	+ 1.13	— 49.94
	63 Aurigæ	11	7 4 36.41	+ 0.21	— 39.28		β Leonis Minoris	11	10 22 14.39	+ 0.74	— 49.89
	25 (H) Camelop.	5	7 8 15.73	— 5.97	— 38.89		9 (H) Draconis	5	10 26 28.77	— 2.42	— 49.79
	λ Geminorum	11	7 12 18.01	+ 0.73	— 39.11		226 (B) Cephei, s. p.	5	10 31 0.29	+ 4.93	— 49.80
	δ Geminorum	11	7 14 4.84	+ 0.62	— 39.14		33 Sextantis	11	10 36 31.61	+ 1.54	— 50.00
	ι Geminorum	9	7 19 25.19	+ 0.49	— 39.18		41 Leonis Minoris	11	10 38 9.39	+ 1.06	— 50.03
	β Canis Majoris	11	7 21 43.05	+ 0.89	— 38.99		42 Leonis Minoris	11	10 40 28.18	+ 0.89	— 49.99
	α^2 Geminorum	11	7 28 6.25	+ 0.41	— 39.06		γ Leonis	11	10 44 11.72	+ 1.30	— 49.89
Mar. 15.3 L. C. H.	ι Geminorum	11	7 19 25.47	+ 0.60	— 39.59	April 1.3 L. C. H.	Bradley 1147	5	8 6 20.61	— 2.37	— 50.55
	β Canis Majoris	11	7 21 43.50	+ 0.99	— 39.56		ζ Cancri	11	8 6 37.07	+ 1.03	— 50.57
	α^2 Geminorum	11	7 28 6.59	+ 0.52	— 39.63		β Cancri	11	8 11 16.09	+ 1.19	— 50.56
	λ Ursæ Min., s. p.	5	7 35 14.48	+ 48.72	— 39.99		κ Cephei	5	8 13 23.26	+ 5.08	— 50.57
	π Geminorum	11	7 40 56.71	+ 0.48	— 39.69		30 Monocerotis	11	8 20 53.30	+ 1.44	— 50.55
	Groom. 1374	5	7 47 29.75	— 2.10	— 39.87		Groom. 1450	10	8 26 28.46	+ 0.57	— 50.71
	ω^1 Cancri	11	7 54 48.65	+ 0.67	— 39.59		η Cancri	8	8 27 3.84	+ 0.97	— 50.55
	χ Geminorum	11	7 57 17.92	+ 0.60	— 39.73		σ Hydræ	11	8 33 43.86	+ 1.30	— 50.46
							γ Cancri	11	8 37 38.32	+ 0.95	— 50.63

DATE AND OBSERVER	OBJECT	THREADS	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	CORRECTIONS	
			MEAN THREAD					MEAN THREAD	
			Instrument	Clock				Instrument	Clock
1888					1888				
April 2.3	Bradley 1147	5	h. m. s.	s.	April 11.3	χ Geminorum	11	h. m. s.	s.
L. C. H.	ζ^1 Cancri	11	8 6 21.13	— 1.59	H. S. C.	Bradley 1147	5	7 57 39.46	+ 0.97
	β Cancri	11	8 6 37.91	+ 1.27		κ Cephei, s. p.	5	8 6 30.52	— 1.58
	κ Cephei, s. p.	5	8 11 16.98	+ 1.41		30 Monocerotis	11	8 13 36.43	+ 4.36
	30 Monocerotis	11	8 13 25.16	+ 4.61		η Cancri	11	8 21 4.60	+ 1.47
	η Cancri	11	8 20 54.23	+ 1.62		σ Hydrae	11	8 27 15.12	+ 1.09
	σ Hydrae	11	8 27 4.75	+ 1.21		σ^2 Cancri	8	8 33 55.18	+ 1.36
	γ Cancri	11	8 33 44.79	+ 1.50				8 48 26.10	+ 0.92
	δ Cancri	8	8 37 39.18	+ 1.21	April 12.4	β Leonis	11	11 44 24.06	+ 0.93
	ι Cancri	11	8 39 10.04	+ 1.26	H. S. C.	Groom. 4163, s. p.	5	11 50 19.71	+ 3.72
			8 40 46.17	+ 1.06		α^1 Draconis	5	12 8 6.62	— 2.78
April 3.3	Bradley 1147	5	8 6 22.68	— 2.08		η Virginis	11	12 15 13.72	+ 1.18
L. C. H.	ζ^1 Cancri	11	8 6 39.39	+ 1.08		20 Comae	11	12 25 9.36	+ 0.80
	β Cancri	11	8 11 18.43	+ 1.23		24 Comae	11	12 30 34.36	+ 0.85
	κ Cephei, s. p.	5	8 13 26.23	+ 4.79		31 Comae	6	12 47 18.52	+ 0.68
	30 Monocerotis	11	8 20 55.68	+ 1.46		δ Virginis	11	12 51 1.08	+ 1.00
	η Cancri	11	8 27 6.30	+ 1.02		ϵ Virginis	11	12 57 39.63	+ 0.99
	σ Hydrae	11	8 33 46.24	+ 1.33	April 13.3	β Cephei, s. p.	5	9 28 12.80	+ 3.15
	γ Cancri	11	8 37 40.69	+ 1.01	H. S. C.	6 Sextantis	11	9 46 38.89	+ 1.22
	δ Cancri	11	8 39 11.51	+ 1.07		π Leonis	11	9 55 21.39	+ 1.02
	ι Cancri	11	8 40 47.75	+ 0.85		η Leonis	11	10 2 17.52	+ 0.88
April 4.3	Bradley 1147	5	8 6 23.64	— 1.76		λ Hydrae	11	10 6 11.20	+ 1.36
L. C. H.	ζ^1 Cancri	11	8 6 40.68	+ 1.08		ζ Leonis	11	10 11 31.76	+ 0.75
	β Cancri	11	8 11 19.67	+ 1.21		γ^1 Leonis	11	10 14 51.88	+ 0.82
	κ Cephei, s. p.	5	8 13 28.10	+ 4.38		β Leonis Minoris	11	10 22 28.95	+ 0.48
	30 Monocerotis	11	8 20 56.93	+ 1.42		9 (H) Draconis	5	10 25 42.26	— 2.23
	η Cancri	11	8 27 7.46	+ 1.02	April 14.3	Groom. 1586	5	9 49 28.76	— 1.24
	σ Hydrae	11	8 33 47.52	+ 1.30	H. S. C.	79 Draconis, s. p.	5	9 52 28.56	+ 3.46
	γ Cancri	11	8 37 41.96	+ 1.01		π Leonis	11	9 55 22.52	+ 1.13
	δ Cancri	11	8 39 12.83	+ 1.07		α Leonis	8	10 3 29.29	+ 1.09
	ι Cancri	11	8 40 48.99	+ 0.87		γ^1 Leonis	11	10 14 52.92	+ 0.96
April 5.3	κ Cancri	11	9 2 35.60	+ 1.33	April 16.3	ζ Hydrae	11	8 50 34.89	+ 1.19
L. C. H.	θ Hydrae	11	9 9 26.91	+ 1.46	B. W. H.	12-Yr. Cat. 1879, s. p.	5	8 53 40.27	+ 5.57
	83 Cancri	11	9 13 38.78	+ 1.20		κ Cancri	11	9 2 47.43	+ 1.13
	40 Lyncis	8	9 15 9.12	+ 0.89		θ Hydrae	11	9 9 38.69	+ 1.25
	1 (H) Draconis	5	9 22 6.42	— 4.09		83 Cancri	8	9 13 50.57	+ 1.00
	β Cephei, s. p.	5	9 28 3.84	+ 3.44		α Lyncis	8	9 15 20.95	+ 0.70
	α Leonis	11	9 36 5.30	+ 1.33		1 (H) Draconis	5	9 22 16.83	— 4.19
April 6.3	η Cancri	11	8 27 9.51	+ 1.13	April 19.3	10 Leonis Minoris	11	9 28 31.31	+ 0.74
L. C. H.	σ Hydrae	11	8 33 49.58	+ 1.42	B. W. H.	α Leonis	13	9 36 19.69	+ 1.28
	γ Cancri	11	8 37 43.93	+ 1.12		ϵ Leonis	11	9 40 39.10	+ 1.03
	δ Cancri	11	8 39 14.80	+ 1.18		μ Leonis	11	9 47 33.30	+ 0.98
	ι Cancri	11	8 40 50.93	+ 0.98		Groom. 1586	5	9 49 34.18	— 1.55
	σ^2 Cancri	11	8 48 20.55	+ 0.95		79 Draconis, s. p.	5	9 52 33.61	+ 4.14
	12-Yr. Cat. 1879, s. p.	5	8 53 28.17	+ 5.49		π Leonis	11	9 55 27.19	+ 1.32
	σ^2 Ursae Majoris	5	9 1 29.52	— 0.45		η Leonis	8	10 2 23.36	+ 1.17
April 7.3	β Cancri	11	8 11 23.14	+ 1.22	April 20.3	α Leonis	13	10 3 33.97	+ 1.26
B. W. H.	κ Cephei, s. p.	5	8 13 31.69	+ 4.45	B. W. H.	6 Sextantis	11	9 45 46.00	+ 1.27
	30 Monocerotis	11	8 21 0.49	+ 1.43		μ Leonis	8	9 46 34.65	+ 0.77
	η Cancri	11	8 27 0.90	+ 1.03		Groom. 1586	5	9 48 35.06	— 1.45
	σ Hydrae	11	8 33 50.97	+ 1.31		79 Draconis, s. p.	5	9 51 35.34	+ 3.50
	γ Cancri	11	8 37 45.36	+ 1.02		π Leonis	11	9 54 28.44	+ 1.07
	δ Cancri	11	8 39 16.30	+ 1.08		η Leonis	11	10 1 24.56	+ 0.94
	ι Cancri	11	8 40 52.36	+ 0.88		α Leonis	11	10 2 35.36	+ 1.02
April 8.3	ω^1 Cancri	11	7 55 7.57	+ 0.89	April 21.3	ζ Leonis	11	10 10 38.68	+ 0.81
B. W. H.	χ Geminorum	11	7 57 36.75	+ 0.82	B. W. H.	γ^1 Leonis	11	10 13 58.80	+ 0.88
	Bradley 1147	5	8 6 28.93	— 2.53		1 (H) Draconis	5	9 21 20.61	— 3.74
	β Cancri	11	8 11 24.53	+ 1.22		10 Leonis Minoris	11	9 27 33.57	+ 0.67
	κ Cephei, s. p.	5	8 13 32.40	+ 5.35		α Leonis	11	9 35 21.88	+ 1.12
	η Cancri	11	8 28 12.27	+ 0.99		6 Sextantis	11	9 45 46.88	+ 1.34
	σ Hydrae	11	8 33 52.32	+ 1.33		μ Leonis	8	9 46 35.40	+ 0.77
April 9.4	μ Leonis	11	9 47 23.70	+ 0.76	April 23.4	79 Draconis	5	9 51 36.42	+ 3.40
H. S. C.	π Leonis	11	9 55 17.45	+ 1.09	B. W. H.	π Leonis	11	9 54 29.38	+ 1.15
	η Leonis	11	10 2 13.47	+ 0.95		λ Draconis	5	11 25 1.50	— 0.69
	32 Ursae Majoris	5	10 10 55.57	— 0.71		ν Leonis	11	11 31 26.34	+ 1.15
	γ^1 Leonis	11	10 14 47.84	+ 0.89		β Leonis	11	11 34 34.53	+ 0.95
	226 (B) Cephei, s. p.	5	10 31 11.66	+ 4.28		γ Cephei, s. p.	5	11 34 53.01	+ 3.73
	41 Leonis Minoris	11	10 38 19.87	+ 0.83		β Virginis	11	11 45 5.18	+ 1.12
						π Virginis	11	11 55 21.75	+ 1.05
						α Virginis	11	11 59 43.95	+ 1.02

* Clock set back 1 minute.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888.			h. m. s.	s.	s.	1888.			h. m. s.	s.	
April 24.3	1 (H) Draconis	5	9 21 23.07	— 4.14	— 14.91	May 3.3	ζ Leonis	11	10 10 48.98	+ 0.97	— 21.96
B. W. H.	10 Leonis Minoris	13	9 27 35.89	+ 0.72	— 14.70	L. C. H.	γ ¹ Leonis	11	10 14 9.20	+ 1.02	— 21.98
	o Leonis	11	9 35 24.20	+ 1.21	— 14.69		β Leonis Minoris	11	10 21 46.00	+ 0.76	— 22.00
	ε Leonis	11	9 39 43.73	+ 0.98	— 14.78		9 (H) Draconis	5	10 25 57.79	— 1.53	— 21.78
	6 Sextantis	7	9 45 49.10	+ 1.44	— 14.65		ρ Leonis	11	10 27 16.11	+ 1.16	— 21.91
	μ Leonis	8	9 46 37.88	+ 0.94	— 14.87		226 (B) Cephei, s. p.	5	10 30 35.62	+ 3.91	— 21.77
	79 Draconis, s. p.	5	9 51 38.70	+ 3.78	— 14.88		33 Sextantis	11	10 36 3.57	+ 1.30	— 22.05
	π Leonis	11	9 54 31.70	+ 1.24	— 14.80		41 Leonis Minoris	11	10 37 41.08	+ 0.98	— 22.00
April 25.4	ι Cephei, s. p.	5	10 45 53.19	+ 2.68	— 15.27	May 5.3	42 Leonis Minoris	11	10 39 59.87	+ 0.86	— 22.06
B. W. H.	Groom. 1706	5	10 51 17.84	— 2.12	— 15.26	L. C. H.	l Leonis	11	10 43 43.62	+ 1.14	— 21.95
	χ Leonis	13	10 59 29.17	+ 1.22	— 15.29		ζ Leonis	11	10 10 51.04	+ 0.51	— 23.59
	ν Ursæ Majoris	11	11 12 41.26	+ 0.81	— 15.42		γ ¹ Leonis	11	10 14 11.25	+ 0.59	— 23.62
	σ Leonis	11	11 15 36.68	+ 1.24	— 15.41		β Leonis Minoris	11	10 21 48.08	+ 0.22	— 23.58
	τ Leonis	11	11 22 25.65	+ 1.28	— 15.40		9 (H) Draconis	5	10 26 0.77	— 2.87	— 23.57
	υ Leonis	11	11 31 27.80	+ 1.33	— 15.34		ρ Leonis	11	10 27 18.18	+ 0.78	— 23.63
April 26.3	o Leonis	8	9 35 25.42	+ 1.37	— 16.10	May 6.3	226 (B) Cephei, s. p.	5	10 30 37.08	+ 4.41	— 23.55
B. W. H.	ε Leonis	13	9 39 44.78	+ 1.19	— 16.07	B. W. H.	33 Sextantis	11	10 36 5.50	+ 0.97	— 23.67
	6 Sextantis	8	9 45 50.24	+ 1.56	— 15.94		41 Leonis Minoris	11	10 37 43.23	+ 0.52	— 23.72
	μ Leonis	8	9 46 38.79	+ 1.15	— 16.02		42 Leonis Minoris	11	10 40 1.95	+ 0.36	— 23.67
	Groom. 1506	5	9 48 38.56	— 0.71	— 16.13		l Leonis	11	10 43 45.57	+ 0.75	— 23.53
	79 Draconis, s. p.	5	9 51 40.42	+ 3.46	— 16.13	May 14.4	ζ Leonis	11	10 10 52.04	+ 0.54	— 24.63
	π Leonis	11	9 54 32.80	+ 1.40	— 16.09	L. C. H.	γ ¹ Leonis	11	10 14 12.15	+ 0.61	— 24.56
April 27.3	o Leonis	11	9 35 25.82	+ 1.48	— 16.63		β Leonis Minoris	8	10 21 49.08	+ 0.23	— 24.61
B. W. H.	ε Leonis	11	9 39 45.27	+ 1.25	— 16.64		9 (H) Draconis	5	10 26 1.80	— 2.97	— 24.58
	6 Sextantis	13	9 45 50.79	+ 1.72	— 16.66		ρ Leonis	13	10 27 19.10	+ 0.81	— 24.59
	μ Leonis	13	9 46 39.28	+ 1.21	— 16.59		226 (B) Cephei, s. p.	5	10 30 37.98	+ 4.61	— 24.57
	Groom. 1586	5	9 48 39.51	— 1.19	— 16.67		33 Sextantis	11	10 36 6.54	+ 1.00	— 24.76
	π Leonis	13	9 54 33.21	+ 1.52	— 16.64		41 Leonis Minoris	11	10 37 44.16	+ 0.55	— 24.70
	η Leonis	11	10 1 29.25	+ 1.38	— 16.57	May 16.3	42 Leonis Minoris	11	10 40 2.95	+ 0.38	— 24.70
	α Leonis	11	10 2 40.02	+ 1.47	— 16.62	L. C. H.	Groom. 2001	5	13 23 49.92	— 2.21	— 28.36
April 28.3	o Leonis	11	9 35 26.66	+ 1.48	— 17.48		ζ Virginis	8	13 29 27.89	+ 0.59	— 28.04
B. W. H.	ε Leonis	11	9 39 45.96	+ 1.32	— 17.41		B. A. C. 4536	8	13 30 17.28	— 0.08	— 28.20
	6 Sextantis	13	9 45 51.53	+ 1.67	— 17.37		m Virginis	11	13 36 12.68	+ 0.72	— 28.01
	μ Leonis	8	9 46 40.01	+ 1.28	— 17.40		τ Bootis	11	13 42 25.46	+ 0.31	— 28.12
	Groom. 1586	5	9 48 39.57	— 0.36	— 17.62		η Bootis	11	13 49 50.14	+ 0.30	— 28.04
	79 Draconis, s. p.	3	9 51 42.24	+ 3.28	— 17.62		50 Cassiopeæ, s. p.	5	13 54 15.45	+ 3.22	— 28.35
	π Leonis	11	9 54 33.97	+ 1.51	— 17.40		τ Virginis	11	13 56 25.63	+ 0.56	— 28.07
April 29.3	l Leonis	11	10 43 39.45	+ 1.61	— 18.20	May 19.5	τ Leonis	11	11 22 40.30	+ 0.55	— 29.53
L. C. H.	46 Leonis Minoris	11	10 47 20.46	+ 1.17	— 18.19	L. C. H.	υ Leonis	11	11 31 42.51	+ 0.59	— 29.50
	Groom. 1706	5	10 51 20.38	— 2.14	— 18.10		γ Cephei, s. p.	5	11 35 10.52	+ 3.54	— 29.73
	χ Leonis	11	10 59 31.66	+ 1.68	— 18.28		β Leonis	11	11 43 50.73	+ 0.41	— 29.62
	ρ ³ Leonis	11	11 1 28.65	+ 1.76	— 18.23		π Virginis	11	11 55 37.93	+ 0.50	— 29.60
	π Cephei, s. p.	5	11 4 32.40	+ 4.46	— 18.12		o Virginis	11	12 0 0.15	+ 0.48	— 29.57
	δ Leonis	11	11 8 26.56	+ 1.45	— 18.18	May 20.4	4 (H) Draconis	5	12 7 31.46	— 2.69	— 29.72
April 30.3	ζ Leonis	11	10 10 45.70	+ 1.42	— 19.08	B. W. H.	η Virginis	11	12 14 40.50	+ 0.59	— 29.57
L. C. H.	γ ¹ Leonis	11	10 14 5.84	+ 1.47	— 19.02		5 Ursæ Minoris	5	14 28 23.69	— 2.59	— 31.02
	β Leonis Minoris	11	10 21 42.66	+ 1.24	— 19.09	May 19.5	π Bootis	11	14 35 59.60	+ 0.32	— 30.77
	9 (H) Draconis	5	10 25 54.37	— 0.54	— 19.13	L. C. H.	μ Virginis	11	14 37 41.06	+ 0.63	— 30.73
	ρ Leonis	11	10 27 12.88	+ 1.59	— 19.07		ε Bootis	11	14 40 37.78	+ 0.15	— 30.68
	33 Sextantis	11	10 36 0.27	+ 1.72	— 19.13		47 (H) Cephei, s. p.	5	14 51 35.16	+ 4.54	— 30.99
	41 Leonis Minoris	11	10 37 37.80	+ 1.44	— 19.14		β Bootis	11	14 58 16.24	— 0.10	— 30.85
	42 Leonis Minoris	11	10 39 56.56	+ 1.33	— 19.17		ψ Bootis	11	15 0 10.92	+ 0.15	— 30.79
	l Leonis	11	10 43 40.34	+ 1.57	— 19.06	May 26.4	6 Ursæ Minoris	5	12 15 28.87	— 26.30	— 31.26
May 1.3	ζ Leonis	11	10 10 46.85	+ 1.25	— 20.08	L. C. H.	20 Comæ	11	12 24 37.40	+ 0.34	— 31.14
L. C. H.	γ ¹ Leonis	11	10 14 6.96	+ 1.31	— 20.00		24 Comæ	11	12 30 2.47	+ 0.39	— 31.22
	β Leonis Minoris	11	10 21 43.86	+ 1.00	— 20.07		γ Virginis	11	12 36 30.45	+ 0.67	— 30.97
	9 (H) Draconis	5	10 25 55.90	— 1.62	— 19.65		31 Comæ	11	12 46 46.57	+ 0.23	— 31.14
	ρ Leonis	11	10 27 13.95	+ 1.48	— 20.04		δ Virginis	11	12 50 29.29	+ 0.60	— 31.16
	226 (B) Cephei, s. p.	5	10 30 32.73	+ 4.49	— 19.63	May 28.4	43 (H) Cephei, s. p.	5	12 53 47.66	+ 11.08	— 31.36
	33 Sextantis	11	10 36 1.39	+ 1.65	— 20.19	L. C. H.	ε Virginis	11	12 57 7.78	+ 0.50	— 31.10
	41 Leonis Minoris	11	10 37 38.98	+ 1.26	— 20.16		α Virginis	11	13 19 51.54	+ 1.05	— 33.75
	42 Leonis Minoris	11	10 39 57.76	+ 1.12	— 20.18		τ Bootis	11	13 42 30.79	+ 0.64	— 33.83
	l Leonis	11	10 43 41.45	+ 1.45	— 20.06		η Bootis	11	13 49 55.54	+ 0.63	— 33.80
May 2.3	ζ Leonis	11	10 10 47.97	+ 1.00	— 20.96	May 26.4	50 Cassiopeæ, s. p.	5	13 54 21.73	+ 3.01	— 33.81
L. C. H.	γ ¹ Leonis	11	10 14 8.15	+ 1.05	— 20.94	L. C. H.	τ Virginis	11	13 56 31.13	+ 0.88	— 33.92
	β Leonis Minoris	11	10 21 45.04	+ 0.77	— 21.03		ζ Virginis	11	13 29 33.47	+ 1.08	— 34.16
	9 (H) Draconis	5	10 25 56.83	— 1.58	— 20.70		m Virginis	11	13 36 18.27	+ 1.19	— 34.11
	ρ Leonis	11	10 27 15.17	+ 1.20	— 21.00		τ Bootis	11	13 42 30.96	+ 0.82	— 34.19
	226 (B) Cephei, s. p.	5	10 30 34.45	+ 3.96	— 20.73		η Bootis	11	13 49 55.65	+ 0.81	— 34.10
	33 Sextantis	11	10 36 2.62	+ 1.35	— 21.13		τ Virginis	11	13 56 31.17	+ 1.05	— 34.13
	41 Leonis Minoris	11	10 37 40.19	+ 1.01	— 21.13		δ Bootis	11	14 5 52.23	+ 0.70	— 34.16
	42 Leonis Minoris	11	10 39 58.91	+ 0.88	— 21.10		κ Virginis	11	14 7 29.62	+ 1.22	— 34.10
	l Leonis	11	10 43 42.73	+ 1.18	— 21.09		4 Ursæ Minoris	5	14 9 57.73	— 2.29	— 34.09

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
June 1.3 L. C. H.	η Virginis	11	12 14 45.37	+ 0.73	— 34.72	June 12.3 L. C. H.	31 Comæ	11	12 46 58.91	+ 0.62	— 44.17
	20 Comæ	11	12 24 40.83	+ 0.42	— 34.78		δ Virginis	11	12 50 41.86	+ 0.93	— 44.24
	24 Comæ	11	12 30 5.85	+ 0.47	— 34.79		ϵ Virginis	11	12 57 20.40	+ 0.84	— 44.27
	γ Virginis	11	12 36 34.00	+ 0.74	— 34.68		θ Virginis	11	13 4 53.25	+ 1.04	— 44.21
	31 Comæ	13	12 46 50.01	+ 0.33	— 34.81		43 Comæ	11	13 7 23.24	+ 0.62	— 44.20
	32 ² (H) Camelop.	5	12 49 2.83	— 6.46	— 34.80		α Ursæ Min., s. p.	5	13 17 51.52	+ 29.52	— 44.12
	δ Virginis	11	12 50 32.82	+ 0.67	— 34.85		Groom. 2001	5	13 24 3.36	— 1.15	— 44.24
	43 (H) Cephei, s. p.	5	12 53 54.56	+ 10.64	— 34.89		ζ Virginis	13	13 29 43.53	+ 0.98	— 44.22
	ϵ Virginis	11	12 57 11.29	+ 0.58	— 34.80		B. A. C. 4536.	8	13 30 32.47	+ 0.45	— 44.23
June 3.3 B. W. H.	20 Comæ	11	12 24 42.41	+ 0.47	— 36.43	June 13.4 L. C. H.	B. A. C. 4536.	8	13 30 33.47	+ 0.58	— 45.37
	24 Comæ	11	12 30 7.53	+ 0.52	— 36.55		τ Bootis	11	13 42 41.98	+ 0.86	— 45.37
	γ Virginis	11	12 36 35.67	+ 0.82	— 36.45		η Bootis	8	13 50 6.76	+ 0.85	— 45.37
	31 Comæ	11	12 46 51.73	+ 0.36	— 36.58		50 Cassiopeæ	5	13 54 34.72	+ 2.74	— 45.38
	32 ² (H) Camelop.	5	12 49 5.48	— 7.37	— 36.90		τ Virginis	11	13 56 42.39	+ 1.05	— 45.43
	δ Virginis	11	12 50 34.46	+ 0.74	— 36.58		d Bootis	11	14 6 3.30	+ 0.76	— 45.41
	43 (H) Cephei, s. p.	5	12 53 55.69	+ 12.12	— 36.96		4 Ursæ Minoris	5	14 10 7.39	— 1.74	— 45.41
	ϵ Virginis	11	12 57 12.99	+ 0.64	— 36.55		α Bootis	13	14 11 18.81	+ 0.85	— 45.29
June 4.3 B. W. H.	20 Comæ	11	12 24 43.23	+ 0.72	— 37.51	June 14.3 L. C. H.	α Ursæ Min., s. p.	5	13 17 53.38	+ 31.18	— 46.09
	24 Comæ	11	12 30 8.32	+ 0.77	— 37.60		Groom. 2001	5	13 24 5.02	— 1.00	— 46.16
	γ Virginis	11	12 35 36.44	+ 1.08	— 37.49		ζ Virginis	11	13 29 45.35	+ 1.29	— 46.36
	31 Comæ	11	12 46 52.40	+ 0.61	— 37.51		m Virginis	8	13 36 30.25	+ 1.41	— 46.42
	32 ² (H) Camelop.	5	12 49 4.88	— 6.74	— 37.11		τ Bootis	11	13 42 42.84	+ 1.03	— 46.37
	δ Virginis	13	12 50 35.28	+ 1.00	— 37.67		η Bootis	11	13 50 7.51	+ 1.02	— 46.29
	43 (H) Cephei, s. p.	5	12 53 56.61	+ 11.68	— 37.17		τ Virginis	11	13 56 43.14	+ 1.26	— 46.40
	ϵ Virginis	11	12 57 13.78	+ 0.89	— 37.60		d Bootis	11	14 6 4.07	+ 0.91	— 46.33
June 5.3 B. W. H.	24 Comæ	11	12 30 9.10	+ 0.99	— 38.61	June 15.3 L. C. H.	κ Virginis	11	14 7 41.59	+ 1.43	— 46.35
	γ Virginis	11	12 36 37.22	+ 1.27	— 38.46		α Bootis	11	14 11 19.71	+ 1.02	— 46.36
	31 Comæ	11	12 46 53.22	+ 0.85	— 38.59		δ Virginis	11	12 50 44.15	+ 1.34	— 46.97
	32 ² (H) Camelop.	5	12 49 4.23	— 5.16	— 38.21		ϵ Virginis	11	12 57 22.59	+ 1.25	— 46.89
	δ Virginis	11	12 50 36.01	+ 1.19	— 38.59		θ Virginis	11	13 4 55.54	+ 1.47	— 46.96
	43 (H) Cephei, s. p.	5	12 53 59.83	+ 9.77	— 38.22		43 Comæ	11	13 7 25.49	+ 1.00	— 46.87
	ϵ Virginis	11	12 57 14.62	+ 1.10	— 38.66		α Ursæ Min., s. p.	5	13 17 57.00	+ 29.25	— 46.98
June 6.3 B. W. H.	24 Comæ	13	12 30 9.66	+ 0.99	— 39.18		Groom. 2001	5	13 24 5.42	— 0.77	— 46.85
	γ Virginis	11	12 36 37.83	+ 1.26	— 39.07		ζ Virginis	13	13 29 45.78	+ 1.41	— 46.92
	31 Comæ	11	12 46 53.75	+ 0.86	— 39.14		B. A. C. 4536.	13	13 30 34.73	+ 0.83	— 46.91
	32 ² (H) Camelop.	5	12 49 4.54	— 4.96	— 38.89		m Virginis	11	13 36 30.60	+ 1.52	— 46.89
	δ Virginis	11	12 50 36.58	+ 1.19	— 39.17	June 16.4 L. C. H.	η Bootis	11	13 50 8.47	+ 1.00	— 47.25
	α Canum Venat.	10	12 51 26.61	+ 0.67	— 39.14		50 Cassiopeæ, s. p.	5	13 54 36.84	+ 2.58	— 47.13
	43 (H) Cephei, s. p.	5	12 54 1.13	+ 9.47	— 38.96		τ Virginis	11	13 56 44.14	+ 1.20	— 47.35
	ϵ Virginis	11	12 57 15.13	+ 1.10	— 39.18		d Bootis	11	14 6 5.13	+ 0.92	— 47.42
June 7.3 B. W. H.	20 Comæ	13	18 24 45.15	+ 0.73	— 39.47		4 Ursæ Minoris	5	14 10 8.45	— 1.32	— 47.13
	24 Comæ	11	12 30 10.24	+ 0.78	— 39.56		α Bootis	13	14 11 20.53	+ 1.00	— 47.18
	γ Virginis	11	12 36 38.40	+ 1.05	— 39.44		ρ Bootis	11	14 27 47.95	+ 0.85	— 47.28
	31 Comæ	11	12 46 54.40	+ 0.64	— 39.58		π Bootis	11	14 36 15.46	+ 1.03	— 47.42
	32 ² (H) Camelop.	5	12 49 5.31	— 5.63	— 39.17	June 17.3 B. W. H.	τ Bootis	11	13 42 44.42	+ 1.13	— 48.11
	δ Virginis	11	12 50 37.23	+ 0.98	— 39.62		89 Virginis	8	13 44 34.99	+ 3.62	— 48.13
	α Canum Venat.	8	12 51 27.29	+ 0.45	— 39.62		η Bootis	11	13 50 9.15	+ 1.12	— 48.06
	43 (H) Cephei, s. p.	5	12 54 1.35	+ 9.90	— 39.34		50 Cassiopeæ, s. p.	5	13 54 37.55	+ 2.97	— 48.16
	ϵ Virginis	11	12 57 15.75	+ 0.89	— 39.60		ι Virginis	11	13 55 44.78	+ 1.35	— 48.15
June 8.4 B. W. H.	ρ Bootis	11	14 27 41.80	+ 0.44	— 40.65		d Bootis	11	14 6 5.75	+ 1.02	— 48.14
	5 Ursæ Minoris	5	14 28 31.95	— 1.80	— 40.99	June 18.4 L. C. H.	κ Virginis	8	14 7 43.29	+ 1.53	— 48.14
	π Bootis	11	14 36 9.16	+ 0.64	— 40.69		4 Ursæ Minoris	5	14 10 9.69	— 1.57	— 48.19
	μ Virginis	11	14 37 50.59	+ 0.90	— 40.54		d Bootis	11	14 6 6.25	+ 1.08	— 48.71
	ϵ Bootis	11	14 40 47.41	+ 0.49	— 40.70		κ Virginis	11	14 7 43.85	+ 1.50	— 48.68
	109 Virginis	8	14 41 16.58	+ 0.81	— 40.77		4 Ursæ Minoris	5	14 10 9.34	— 1.00	— 48.49
	47 (H) Cephei, s. p.	5	14 51 46.99	+ 4.12	— 40.98		α Bootis	13	14 11 21.84	+ 1.15	— 48.66
June 9.3 B. W. H.	24 Comæ	11	12 30 12.46	+ 0.64	— 41.66		ρ Bootis	11	14 27 49.15	+ 1.01	— 48.66
	γ Virginis	11	12 36 40.69	+ 0.84	— 41.54		π Bootis	11	14 36 16.61	+ 1.18	— 48.73
	31 Comæ	11	12 46 56.53	+ 0.54	— 41.63		μ Virginis	11	14 37 58.20	+ 1.43	— 48.72
	32 ² (H) Camelop.	5	12 49 5.61	— 4.24	— 41.22	June 19.3 B. W. H.	109 Virginis	11	14 41 23.95	+ 1.35	— 48.72
	δ Virginis	11	12 50 39.40	+ 0.79	— 41.62		47 (H) Cephei, s. p.	5	14 51 56.04	+ 3.56	— 48.52
	α Canum Venat.	10	12 51 29.32	+ 0.40	— 41.63		η Bootis	11	13 50 10.92	+ 1.12	— 49.85
	43 (H) Cephei	5	12 54 6.00	+ 7.73	— 41.28		50 Cassiopeæ, s. p.	5	13 54 39.76	+ 2.64	— 49.89
	ϵ Virginis	11	12 57 17.91	+ 0.72	— 41.61		d Bootis	11	14 6 7.45	+ 1.03	— 49.87
							κ Virginis	11	14 7 44.99	+ 1.47	— 49.80
							4 Ursæ Minoris	5	14 10 10.78	— 1.15	— 49.86
							ι Virginis	8	14 10 58.25	+ 1.40	— 49.87
							2 Virginis	11	14 13 52.68	+ 1.51	— 49.79

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				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
June 20.3	τ Bootis	11	13 42 47.35	+ 1.18	— 51.12	July 8.3	ψ Bootis	11	14 59 47.04	+ 1.01	— 8.05
B. W. H.	89 Virginis	11	13 44 37.98	+ 1.62	— 51.14	L. C. H.	48 (H) Cephei, s. p.	5	15 6 12.95	+ 2.90	— 8.29
	η Bootis	7	13 50 12.17	+ 1.17	— 51.16		δ Bootis	11	15 11 7.70	+ 0.94	— 8.10
	50 Cassiopeæ, s. p.	5	13 54 41.12	+ 2.74	— 51.28		γ^2 Ursæ Minoris . .	5	15 21 4.85	— 0.12	— 8.27
	d Bootis	11	14 6 8.67	+ 1.09	— 51.16		β Coronæ Borealis	11	15 23 21.18	+ 0.99	— 8.12
	κ Virginis	11	14 7 46.25	+ 1.53	— 51.12		a Coronæ Borealis	11	15 30 5.19	+ 1.02	— 8.05
	4 Ursæ Minoris . .	6	14 10 12.14	— 1.16	— 51.29		a Serpentis	11	15 38 53.56	+ 1.23	— 8.18
June 25.3	η Bootis	11	13 50 17.23	+ 1.22	— 56.32		β Serpentis	11	15 41 9.72	+ 1.14	— 8.29
L. C. H.	50 Cassiopeæ, s. p.	5	13 54 46.67	+ 2.88	— 56.58		κ Serpentis	11	15 43 50.44	+ 1.11	— 8.14
	τ Virginis	11	13 56 52.87	+ 1.42	— 56.37		ϵ Serpentis	11	15 45 22.46	+ 1.24	— 8.13
	d Bootis	11	14 6 13.72	+ 1.13	— 56.32	July 10.4	49 Herculis	11	16 47 10.11	+ 0.97	— 10.40
	κ Virginis	11	14 7 51.35	+ 1.56	— 56.32	L. C. H.	κ Ophiuchi	11	16 52 33.17	+ 1.03	— 10.38
	4 Ursæ Minoris . .	5	14 10 17.04	— 1.20	— 56.59		ϵ Herculis	13	16 56 11.71	+ 0.78	— 10.41
	ρ Bootis	11	14 27 56.66	+ 1.06	— 56.35		ϵ Ursæ Minoris . .	5	16 57 47.81	— 2.72	— 10.70
	π Bootis	8	14 36 24.13	+ 1.24	— 56.37		19 (H) Camelop. s. p.	5	17 4 10.29	+ 3.71	— 10.70
	μ Virginis	11	14 38 5.74	+ 1.51	— 56.38		a^1 Herculis	13	17 9 43.67	+ 0.98	— 10.35
	109 Virginis	8	14 41 31.54	+ 1.42	— 56.42		δ Herculis	8	17 10 37.23	+ 0.86	— 10.37
June 26.4	ρ Bootis	13	14 27 58.08	+ 1.04	— 57.71		π Herculis	8	17 11 20.31	+ 0.70	— 10.33
B. W. H.	γ Bootis	8	14 28 32.02	+ 0.93	— 57.71	July 11.3	ψ Bootis	11	14 59 50.46	+ 0.83	— 11.33
	5 Ursæ Minoris . .	5	14 28 46.21	— 0.56	— 57.67	L. C. H.	48 (H) Cephei, s. p.	5	15 6 16.41	+ 2.84	— 11.37
	π Bootis	11	14 36 25.60	+ 1.20	— 57.81		δ Bootis	13	15 11 10.95	+ 0.77	— 11.22
	μ Virginis	11	14 38 7.18	+ 1.43	— 57.75		γ^2 Ursæ Minoris . .	5	15 21 7.93	— 0.27	— 11.37
	ϵ Bootis	13	14 40 44.41	+ 1.09	— 57.74		β Coronæ Borealis	11	15 23 24.56	+ 0.82	— 11.37
	109 Virginis	8	14 41 32.93	+ 1.35	— 57.75		a Coronæ Borealis	11	15 30 8.66	+ 0.84	— 11.35
	a^2 Libræ	11	14 45 38.61	+ 1.54	— 57.66		a Serpentis	11	15 38 56.88	+ 1.02	— 11.31
	Piazzi XIV, 221	11	14 51 54.04	+ 1.22	— 57.84		β Serpentis	11	15 41 12.98	+ 0.95	— 11.39
	47 (H) Cephei, s. p.	5	14 52 6.11	+ 3.48	— 57.66		κ Serpentis	11	15 43 53.79	+ 0.92	— 11.33
June 30.4	μ^1 Bootis	11	15 21 18.71	+ 0.71	— 62.40		ϵ Serpentis	11	15 45 25.82	+ 1.03	— 11.30
L. C. H.	β Coronæ Borealis	11	15 24 15.71	+ 0.81	— 62.38	July 13.3	μ^1 Bootis	11	15 20 29.18	+ 0.60	— 12.95
	a Coronæ Borealis	11	15 30 59.71	+ 0.83	— 62.28	L. C. H.	β Coronæ Borealis	11	15 23 26.25	+ 0.69	— 12.95
	γ Camelop., s. p.	5	15 39 31.72	+ 2.22	— 62.37		a Coronæ Borealis	11	15 30 10.31	+ 0.71	— 12.90
	β Serpentis	11	15 42 4.10	+ 0.94	— 62.42		a Serpentis	11	15 38 58.54	+ 0.87	— 12.84
	κ Serpentis	11	15 44 44.92	+ 0.92	— 62.38		β Serpentis	11	15 41 14.75	+ 0.80	— 13.03
	ϵ Serpentis	11	15 46 16.90	+ 1.03	— 62.31		κ Serpentis	11	15 43 55.54	+ 0.78	— 12.96
	ζ Ursæ Minoris . .	5	15 49 11.38	— 1.02	— 62.38		ϵ Serpentis	11	15 45 27.59	+ 0.88	— 12.94
	ϵ Coronæ Borealis	11	15 54 0.17	+ 0.83	— 62.30		ζ Ursæ Minoris . .	5	15 48 20.32	— 0.90	— 12.50
July 1.3	ρ Bootis	13	14 28 3.83	+ 0.77	— 63.25		ϵ Coronæ Borealis	11	15 53 10.75	+ 0.71	— 12.89
B. W. H.	γ Bootis	8	14 28 37.83	+ 0.67	— 63.32		Groom. 750 s. p.	5	16 1 42.02	+ 5.37	— 12.50
	5 Ursæ Minoris . .	5	14 28 51.57	— 0.86	— 63.11	July 14.3	ψ Bootis	11	14 59 53.36	+ 0.78	— 14.22
	π Bootis	11	13 36 31.32	+ 0.92	— 63.29	L. C. H.	δ Bootis	11	15 11 13.84	+ 0.73	— 14.12
	μ Virginis	11	14 38 12.97	+ 1.13	— 63.28		μ^1 Bootis	11	15 20 30.23	+ 0.68	— 14.09
	ϵ Bootis	13	14 41 9.48	+ 0.81	— 63.28		β Coronæ Borealis	8	15 23 27.35	+ 0.77	— 14.15
	109 Virginis	8	14 41 38.69	+ 1.06	— 63.26		a Coronæ Borealis	11	15 30 11.42	+ 0.79	— 14.10
	Piazzi XIV, 221	11	14 51 59.71	+ 0.94	— 63.27		γ Camelop., s. p.	5	15 38 44.68	+ 1.97	— 14.09
	47 (H) Cephei, s. p.	5	14 52 12.63	+ 3.36	— 63.14		β Serpentis	11	15 41 15.91	+ 0.88	— 14.28
July 3.4	β Herculis	11	16 25 30.40	+ 0.88	— 5.25		κ Serpentis	11	15 43 56.68	+ 0.86	— 14.19
B. W. H.	49 Herculis	11	16 47 5.04	+ 0.95	— 5.28		ϵ Serpentis	11	15 45 28.70	+ 0.96	— 14.13
	κ Ophiuchi	11	16 52 28.02	+ 1.00	— 5.22		ϵ Ursæ Minoris . .	5	15 48 21.69	— 0.80	— 14.07
	ϵ Herculis	11	16 56 6.61	+ 0.77	— 5.27	July 15.3	μ^1 Bootis	11	15 20 31.42	+ 0.76	— 15.38
	ϵ Ursæ Minoris . .	5	16 57 42.87	— 2.42	— 5.35	B. W. H.	a Serpentis	11	15 39 0.83	+ 1.11	— 15.38
	19 (H) Camelop. s. p.	5	17 4 4.59	+ 3.43	— 5.41		β Serpentis	11	15 41 16.96	+ 1.02	— 15.48
	a^1 Herculis	13	17 9 38.56	+ 0.95	— 5.21		μ Serpentis	13	15 44 2.21	+ 1.20	— 15.36
	δ Herculis	8	17 10 32.16	+ 0.85	— 5.27		ϵ Serpentis	13	15 45 29.77	+ 1.12	— 15.37
July 5.4	μ^1 Bootis	8	15 20 22.51	+ 0.81	— 6.37		ζ Ursæ Minoris . .	5	15 48 23.11	— 1.16	— 15.22
B. W. H.	β Coronæ Borealis	11	15 23 19.55	+ 0.93	— 6.39		ϵ Coronæ Borealis	11	15 53 13.04	+ 0.90	— 15.39
	a Coronæ Borealis	11	15 30 3.61	+ 0.94	— 6.34		Groom. 750	5	16 1 43.79	+ 6.79	— 15.22
	γ Camelop., s. p.	5	15 38 35.40	+ 2.49	— 6.00	July 16.3	μ^1 Bootis	11	15 20 32.02	+ 0.84	— 16.08
	a Serpentis	11	15 38 51.88	+ 1.18	— 6.44	B. W. H.	β Coronæ Borealis	11	15 23 29.09	+ 0.95	— 16.09
	β Serpentis	11	15 41 7.91	+ 1.08	— 6.40		a Coronæ Borealis	11	15 30 13.16	+ 0.96	— 16.03
	κ Serpentis	11	15 43 48.74	+ 1.06	— 6.37		γ Camelop., s. p.	5	15 38 46.35	+ 2.49	— 16.16
	ϵ Serpentis	11	15 45 20.73	+ 1.19	— 6.33		a Serpentis	11	15 39 1.45	+ 1.19	— 16.09
	ζ Ursæ Minoris . .	5	15 48 14.74	— 1.14	— 6.00		β Serpentis	11	15 41 17.57	+ 1.10	— 16.18
	ϵ Coronæ Borealis	11	15 53 4.10	+ 0.95	— 6.39		μ Serpentis	11	15 44 2.90	+ 1.29	— 16.15
July 6.4	48 (H) Cephei, s. p.	5	15 6 11.37	+ 2.80	— 6.82		ϵ Serpentis	11	15 45 30.39	+ 1.21	— 16.09
B. W. H.	δ Bootis	11	15 11 6.58	+ 0.90	— 6.91		ζ Ursæ Minoris . .	5	15 48 23.88	— 1.07	— 16.17
	μ^1 Bootis	13	15 20 23.02	+ 0.85	— 6.93	July 17.3	μ^1 Bootis	11	15 20 32.73	+ 0.81	— 16.78
	β Coronæ Borealis	11	15 23 20.06	+ 0.94	— 6.92		β Coronæ Borealis	11	15 23 29.72	+ 0.91	— 16.70
	a Coronæ Borealis	11	13 30 4.04	+ 0.96	— 6.80		a Coronæ Borealis	11	15 30 13.82	+ 0.92	— 16.67
	a Serpentis	11	15 38 52.26	+ 1.16	— 6.81		γ Camelop., s. p.	5	15 38 47.18	+ 2.20	— 16.63
	β Serpentis	11	15 41 8.41	+ 1.08	— 6.91		a Serpentis	11	15 39 2.14	+ 1.12	— 16.72
	μ Serpentis	11	15 43 53.71	+ 1.25	— 6.84		β Serpentis	11	15 41 18.18	+ 1.04	— 16.74
	ϵ Serpentis	11	15 45 21.25	+ 1.17	— 6.84		ϵ Serpentis	11	15 45 31.02	+ 1.13	— 16.65
	ζ Ursæ Minoris . .	5	15 48 15.12	— 0.75	— 6.85		ζ Ursæ Minoris . .	5	15 48 23.99	— 0.83	— 16.62

* Clock set back 1 minute.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888 July 18.3 B. W. H.	<i>a</i> Coronæ Borealis	11	h. m. s. 15 30 14.56	+	s. 0.95 — 17.45	1888 July 29.4 L. C. H.	<i>a</i> ¹ Herculis	13	h. m. s. 17 10 1.66	+	s. 1.02 — 28.52
	<i>a</i> Serpentis	11	15 39 2.87	+	1.16 — 17.50		<i>δ</i> Herculis	8	17 10 55.14	+	0.92 — 28.49
	<i>β</i> Serpentis	8	15 41 18.93	+	1.08 — 17.54		<i>π</i> Herculis	8	17 11 38.20	+	0.77 — 28.50
	<i>μ</i> Serpentis	11	15 44 4.30	+	1.24 — 17.51		Groom. 944, S. P.	3	17 26 27.92	+	6.31 — 28.45
	<i>ε</i> Serpentis	13	15 45 31.79	+	1.17 — 17.47		<i>a</i> Ophiuchi	11	17 30 13.42	+	1.04 — 28.50
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 24.50	—	0.83 — 17.22		<i>β</i> Ophiuchi	11	17 38 25.65	+	1.11 — 28.50
	<i>ε</i> Coronæ Borealis	11	15 53 15.04	+	0.96 — 17.49		<i>μ</i> Herculis	11	17 42 33.98	+	0.89 — 28.48
	Groom. 750	5	16 1 47.38	+	5.97 — 17.19		<i>ψ</i> ¹ Draconis	5	17 44 27.66	—	0.33 — 28.50
July 21.3 L. C. H.	<i>a</i> Serpentis	11	15 39 4.84	+	1.16 — 19.50	July 31.4 B. W. H.	<i>a</i> ¹ Herculis	11	17 10 3.94	+	1.14 — 30.94
	<i>β</i> Serpentis	11	15 41 20.89	+	1.07 — 19.52		<i>δ</i> Herculis	8	17 10 57.46	+	1.03 — 30.95
	<i>κ</i> Serpentis	11	15 44 1.70	+	1.05 — 19.49		Groom. 944, S. P.	4	17 26 30.34	+	6.70 — 30.80
	<i>ε</i> Serpentis	11	15 45 33.78	+	1.17 — 19.49		<i>a</i> Ophiuchi	11	17 30 15.70	+	1.16 — 30.91
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 26.30	—	0.93 — 19.20		<i>ξ</i> Serpentis	11	17 31 41.86	+	1.45 — 30.88
	<i>ε</i> Coronæ Borealis	11	15 53 16.93	+	0.95 — 19.41		<i>β</i> Ophiuchi	11	17 38 27.87	+	1.23 — 30.86
	Groom. 750, S. P.	5	16 1 50.00	+	6.24 — 19.10		<i>μ</i> Herculis	11	17 42 36.20	+	1.00 — 30.83
	<i>δ</i> Ophiuchi	11	16 8 48.40	+	1.25 — 19.43		<i>θ</i> Herculis	11	17 52 56.67	+	0.88 — 30.96
	<i>σ</i> Coronæ Borealis	11	16 10 49.21	+	0.87 — 19.63		35 Draconis	5	17 55 3.21	—	0.85 — 30.81
	<i>ε</i> Ophiuchi	11	16 12 43.58	+	1.27 — 19.48		67 Ophiuchi	11	17 55 33.73	+	1.26 — 30.84
July 22.3 L. C. H.	<i>a</i> Serpentis	11	15 39 5.69	+	1.16 — 20.36	Aug. 1.3 B. W. H.	<i>γ</i> Herculis	11	16 17 30.54	+	1.10 — 31.52
	<i>β</i> Serpentis	11	13 41 21.74	+	1.08 — 20.40		<i>β</i> Herculis	11	16 25 56.14	+	1.09 — 31.48
	<i>κ</i> Serpentis	11	15 44 2.52	+	1.05 — 20.32		<i>ζ</i> Ophiuchi	11	16 31 31.94	+	1.56 — 32.30
	<i>ε</i> Serpentis	11	15 45 34.58	+	1.17 — 20.30		Groom. 848	4	16 34 16.03	+	3.05 — 32.33
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 27.18	—	0.83 — 20.28		49 Herculis	11	16 47 30.91	+	1.15 — 31.57
	<i>ε</i> Coronæ Borealis	11	15 53 17.77	+	0.96 — 20.27		<i>κ</i> Ophiuchi	11	16 52 53.90	+	1.20 — 31.44
	Groom. 750, S. P.	5	16 1 51.61	+	5.97 — 20.23		<i>ε</i> Herculis	13	16 56 32.38	+	1.00 — 31.55
	<i>δ</i> Ophiuchi	11	16 8 49.25	+	1.24 — 20.27		<i>ε</i> Ursæ Minoris . . .	5	16 57 4.46	—	1.68 — 31.27
	<i>σ</i> Coronæ Borealis	11	16 10 49.91	+	0.88 — 20.36	Aug. 2.3	<i>γ</i> Herculis	11	16 17 31.22	+	1.24 — 32.33
	<i>ε</i> Ophiuchi	11	16 22 44.38	+	1.26 — 20.28		<i>β</i> Herculis	11	16 25 56.76	+	1.22 — 32.25
July 23.3 L. C. H.	<i>a</i> Serpentis	11	15 39 6.40	+	1.18 — 21.09		<i>ζ</i> Ophiuchi	11	16 31 31.94	+	1.56 — 32.30
	<i>β</i> Serpentis	11	15 41 22.48	+	1.10 — 21.17		Groom. 848	5	16 34 16.03	+	3.05 — 32.33
	<i>κ</i> Serpentis	11	15 44 3.30	+	1.07 — 21.13		<i>κ</i> Ophiuchi	11	16 52 54.52	+	1.35 — 32.22
	<i>ε</i> Serpentis	11	15 45 35.34	+	1.19 — 21.09		<i>ε</i> Herculis	11	16 56 33.00	+	1.11 — 32.29
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 27.89	—	0.76 — 21.16		<i>d</i> Herculis	11	16 58 1.12	+	1.06 — 32.37
	<i>ε</i> Coronæ Borealis	11	15 53 18.53	+	0.98 — 21.07		<i>ε</i> Ursæ Minoris . . .	5	16 58 5.69	—	1.99 — 32.35
	Groom. 750, S. P.	5	16 1 53.00	+	5.83 — 21.21	Aug. 3.3 B. W. H.	<i>γ</i> Herculis	11	16 17 31.97	+	1.16 — 33.03
	<i>δ</i> Ophiuchi	11	16 8 49.96	+	1.26 — 21.02		<i>β</i> Herculis	11	16 25 57.56	+	1.15 — 33.00
	<i>σ</i> Coronæ Borealis	11	16 10 50.70	+	0.90 — 21.18		<i>ζ</i> Ophiuchi	11	16 31 32.75	+	1.44 — 33.00
	<i>ε</i> Ophiuchi	11	16 12 45.17	+	1.28 — 21.10		Groom. 848	5	16 34 16.93	+	2.60 — 32.68
July 25.3 L. C. H.	<i>a</i> Serpentis	11	15 39 8.55	+	1.17 — 23.27		49 Herculis	11	16 47 32.26	+	1.21 — 33.00
	<i>β</i> Serpentis	11	15 41 24.64	+	1.09 — 23.34		<i>κ</i> Ophiuchi	11	16 52 55.38	+	1.26 — 33.00
	<i>κ</i> Serpentis	11	15 44 5.45	+	1.07 — 23.31		<i>ε</i> Herculis	11	16 56 33.82	+	1.06 — 33.08
	<i>ε</i> Serpentis	11	15 45 37.45	+	1.18 — 23.21		<i>ε</i> Ursæ Minoris . . .	5	16 58 5.36	—	1.47 — 32.70
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 29.60	—	0.72 — 23.10	Aug. 6.3 L. C. H.	49 Herculis	11	16 47 34.95	+	1.24 — 35.76
	<i>ε</i> Coronæ Borealis	11	15 53 20.60	+	0.98 — 23.20		<i>κ</i> Ophiuchi	11	16 52 58.00	+	1.29 — 35.69
	Groom. 750, S. P.	5	16 1 55.69	+	5.58 — 23.15		<i>ε</i> Herculis	11	16 56 36.44	+	1.08 — 35.77
	<i>δ</i> Ophiuchi	11	16 8 52.20	+	1.26 — 23.28		<i>ε</i> Ursæ Minoris . . .	4	16 58 8.07	—	1.50 — 35.82
	<i>σ</i> Coronæ Borealis	11	16 10 52.85	+	0.90 — 23.37		19 (H) Camelop., S. P.	5	17 4 38.93	+	3.12 — 35.79
	<i>ε</i> Ophiuchi	11	16 12 47.37	+	1.27 — 23.31		<i>a</i> ¹ Herculis	13	17 10 8.59	+	1.25 — 35.77
July 26.3 L. C. H.	<i>a</i> Serpentis	11	15 39 9.89	+	1.13 — 24.59		<i>δ</i> Herculis	8	17 11 2.02	+	1.15 — 35.71
	<i>β</i> Serpentis	11	15 41 25.94	+	1.06 — 24.62		<i>π</i> Herculis	8	17 11 45.02	+	1.01 — 35.70
	<i>κ</i> Serpentis	11	15 44 6.73	+	1.04 — 24.57	Aug. 7.3 L. C. H.	<i>η</i> Herculis	11	16 39 40.41	+	0.98 — 36.70
	<i>ε</i> Serpentis	11	15 45 38.80	+	1.14 — 24.54		49 Herculis	11	16 47 35.91	+	1.26 — 36.75
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 30.64	—	0.48 — 24.48		<i>κ</i> Ophiuchi	11	16 52 58.98	+	1.31 — 36.70
	<i>ε</i> Coronæ Borealis	11	15 53 21.97	+	0.96 — 24.53		<i>ε</i> Herculis	13	16 56 37.39	+	1.09 — 36.74
	Groom. 750, S. P.	5	16 1 57.97	+	4.93 — 24.54		<i>ε</i> Ursæ Minoris . . .	5	16 58 9.23	—	1.70 — 36.94
	<i>δ</i> Ophiuchi	11	16 8 53.49	+	1.20 — 24.52		19 (H) Camelop., S. P.	5	17 4 40.02	+	3.30 — 36.94
	<i>σ</i> Coronæ Borealis	11	16 10 54.09	+	0.89 — 24.62		<i>a</i> ¹ Herculis	13	17 10 9.59	+	1.26 — 36.79
	<i>ε</i> Ophiuchi	11	16 12 48.69	+	1.21 — 24.58		<i>δ</i> Herculis	11	17 11 3.03	+	1.16 — 36.75
July 28.3 L. C. H.	<i>a</i> Serpentis	11	15 39 12.43	+	1.09 — 27.11		<i>π</i> Herculis	8	17 11 46.03	+	1.01 — 36.72
	<i>β</i> Serpentis	11	15 41 28.56	+	1.01 — 27.22	Aug. 9.4 L. C. H.	<i>θ</i> Herculis	11	17 53 5.05	+	1.01 — 39.58
	<i>κ</i> Serpentis	11	15 44 9.33	+	0.98 — 27.14		67 Ophiuchi	13	17 55 42.24	+	1.34 — 39.49
	<i>ε</i> Serpentis	11	15 45 41.36	+	1.10 — 27.08		<i>δ</i> Ursæ Minoris . . .	5	18 9 20.90	—	5.11 — 39.41
	<i>ζ</i> Ursæ Minoris . . .	5	15 48 33.22	—	0.89 — 26.85		<i>η</i> Serpentis	11	18 16 11.03	+	1.39 — 39.57
	<i>ε</i> Coronæ Borealis	11	15 53 24.57	+	0.89 — 27.09		109 Herculis	11	18 19 35.88	+	1.17 — 39.61
	Groom. 750, S. P.	5	16 1 59.80	+	5.91 — 26.83		23 (H) Camelop., S. P.	5	18 27 40.08	+	3.24 — 39.42
	<i>δ</i> Ophiuchi	11	16 8 56.08	+	1.17 — 27.10		1 Aquilæ	11	18 29 46.98	+	1.44 — 59.57
	<i>σ</i> Coronæ Borealis	11	16 10 56.65	+	0.81 — 27.13		<i>a</i> Lyrae	11	18 33 49.36	+	0.97 — 39.49
	<i>ε</i> Ophiuchi	11	16 12 51.23	+	1.19 — 27.12						

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Aug. 10.3	η Herculis . . .	11	16 39 44.69	+ 0.96	- 41.02	Aug. 23.3	Groom. 944, S. P.	5	17 27 3.29	+ 6.06	- 56.91
L. C. H.	49 Herculis . . .	11	16 47 40.23	+ 1.18	- 41.03		α Ophiuchi . . .	11	17 30 41.51	+ 0.99	- 56.85
	κ Ophiuchi . . .	11	16 53 3.24	+ 1.22	- 40.91		ξ Serpentis . . .	11	17 32 7.84	+ 1.23	- 56.90
	ϵ Herculis . . .	11	16 56 41.63	+ 1.04	- 40.99		β Ophiuchi . . .	11	17 38 53.83	+ 1.05	- 56.90
	ϵ Ursæ Minoris . .	5	16 58 12.05	- 1.07	- 40.87		μ Herculis . . .	11	17 43 1.98	+ 0.85	- 56.81
	19 (H) Camelop., S. P.	5	17 4 44.92	+ 2.68	- 40.85		θ Herculis . . .	11	17 53 22.40	+ 0.75	- 56.95
	α^1 Herculis . . .	13	17 10 13.83	+ 1.18	- 40.99		67 Ophiuchi . . .	11	17 55 59.66	+ 1.07	- 56.81
	δ Herculis . . .	8	17 11 7.27	+ 1.10	- 40.97		72 Ophiuchi . . .	11	18 3 0.03	+ 1.02	- 56.98
	π Herculis . . .	8	17 11 50.32	+ 0.98	- 41.04		σ Herculis . . .	13	18 4 8.18	+ 0.83	- 56.98
							δ Ursæ Minoris . .	5	18 9 34.67	- 5.31	- 58.27
Aug. 11.3	η Herculis . . .	11	16 39 44.69	+ 0.96	- 41.02	Aug. 24.3	Groom. 944, S. P.	5	17 27 5.35	+ 5.55	- 57.18
L. C. H.	49 Herculis . . .	11	16 47 40.23	+ 1.18	- 41.03	L. C. H.	α Ophiuchi . . .	11	17 30 42.78	+ 1.09	- 58.24
	κ Ophiuchi . . .	11	16 53 3.24	+ 1.23	- 40.91		ξ Serpentis . . .	11	17 32 9.14	+ 1.33	- 58.31
	ϵ Herculis . . .	11	16 56 41.63	+ 1.04	- 40.99		β Ophiuchi . . .	11	17 38 55.08	+ 1.15	- 58.27
	ϵ Ursæ Minoris . .	5	16 58 13.34	- 1.15	- 42.24		μ Herculis . . .	11	17 43 3.28	+ 0.96	- 58.24
	19 (H) Camelop., S. P.	5	17 4 46.39	+ 2.71	- 42.22		θ Herculis . . .	11	17 53 23.66	+ 0.86	- 58.35
	α^1 Herculis . . .	13	17 10 15.25	+ 1.16	- 42.40		67 Ophiuchi . . .	11	17 56 0.96	+ 1.17	- 58.22
	δ Herculis . . .	8	17 11 8.63	+ 1.07	- 42.32		72 Ophiuchi . . .	11	18 3 1.28	+ 1.12	- 58.34
	π Herculis . . .	8	17 11 51.66	+ 0.96	- 42.38		σ Herculis . . .	13	18 4 9.41	+ 0.94	- 58.34
							δ Ursæ Minoris . .	5	18 9 29.36	- 5.31	- 58.27
Aug. 13.3	49 Herculis . . .	11	16 47 44.57	+ 0.91	- 45.15	Aug. 25.3	Groom. 944, S. P.	5	17 27 6.65	+ 5.72	- 59.36
B. W. H.	κ Ophiuchi . . .	11	16 53 7.65	+ 0.95	- 45.10	L. C. H.	α Ophiuchi . . .	11	17 30 43.76	+ 1.15	- 59.30
	ϵ Herculis . . .	11	16 56 46.06	+ 0.79	- 45.22		ξ Serpentis . . .	11	17 32 10.08	+ 1.42	- 59.36
	ϵ Ursæ Minoris . .	5	16 58 16.07	- 1.38	- 45.07		β Ophiuchi . . .	11	17 38 56.10	+ 1.22	- 59.37
	19 (H) Camelop., S. P.	5	17 4 49.63	+ 2.59	- 45.07		μ Herculis . . .	11	17 43 4.25	+ 1.02	- 59.29
	α^1 Herculis . . .	13	17 10 18.15	+ 0.93	- 45.10		θ Herculis . . .	11	17 53 24.73	+ 0.92	- 59.50
	δ Herculis . . .	8	17 11 11.73	+ 0.84	- 45.22		67 Ophiuchi . . .	11	17 56 1.95	+ 1.25	- 59.31
	π Herculis . . .	8	17 11 54.74	+ 0.74	- 45.28		72 Ophiuchi . . .	11	18 3 2.26	+ 1.18	- 59.40
							σ Herculis . . .	11	18 4 10.40	+ 1.00	- 59.41
Aug. 14.3	49 Herculis . . .	11	16 47 46.05	+ 1.03	- 46.77	Aug. 26.3	δ Ursæ Minoris . .	5	18 9 35.57	- 5.44	- 59.38
B. W. H.	κ Ophiuchi . . .	11	16 53 9.09	+ 1.07	- 46.68	B. W. H.	72 Ophiuchi . . .	11	18 3 3.47	+ 1.09	- 60.53
	ϵ Herculis . . .	11	16 56 47.40	+ 0.90	- 46.69		σ Herculis . . .	8	18 4 11.56	+ 0.93	- 60.51
	ϵ Ursæ Minoris . .	5	16 58 17.60	- 1.38	- 46.76		δ Ursæ Minoris . .	5	18 9 35.69	- 5.06	- 60.24
	19 (H) Camelop., S. P.	5	17 4 51.26	+ 2.75	- 46.73		η Serpentis . . .	11	18 16 31.92	+ 1.20	- 60.46
	α^1 Herculis . . .	13	17 10 19.64	+ 1.04	- 46.72		109 Herculis . . .	11	18 19 56.71	+ 0.99	- 60.49
	δ Herculis . . .	8	17 11 13.10	+ 0.95	- 46.72		α Lyrae	11	18 34 10.14	+ 0.82	- 60.42
	π Herculis . . .	8	17 11 56.10	+ 0.84	- 46.76		110 Herculis . . .	11	18 41 51.86	+ 1.01	- 60.58
							51 (H) Cephei, S. P.	5	18 48 30.41	+ 8.50	- 60.34
Aug. 15.3	ϵ Herculis . . .	11	16 56 48.58	+ 1.04	- 48.02	Aug. 28.3	Groom. 944, S. P.	5	17 27 10.61	+ 5.99	- 62.72
B. W. H.	δ Herculis . . .	11	16 58 16.55	+ 1.00	- 47.97	B. W. H.	α Ophiuchi . . .	11	17 30 47.13	+ 0.93	- 62.50
	ϵ Ursæ Minoris . .	5	16 58 18.16	- 0.91	- 47.93		ξ Serpentis . . .	13	17 32 14.44	+ 1.17	- 62.57
	19 (H) Camelop., S. P.	5	17 4 52.77	+ 2.55	- 47.91		β Ophiuchi . . .	11	17 38 59.43	+ 0.99	- 62.52
	α^1 Herculis . . .	13	17 10 20.67	+ 1.16	- 47.88		μ Herculis . . .	11	17 43 7.70	+ 0.80	- 62.58
	δ Herculis . . .	8	17 11 14.15	+ 1.09	- 47.93		θ Herculis . . .	11	17 53 27.93	+ 0.70	- 62.54
	α Ophiuchi . . .	11	17 30 32.49	+ 1.17	- 47.89		67 Ophiuchi . . .	11	17 56 5.28	+ 1.02	- 62.45
	ξ Serpentis . . .	11	17 31 58.70	+ 1.38	- 47.80		72 Ophiuchi . . .	11	18 3 5.61	+ 0.96	- 62.57
							σ Herculis . . .	13	18 4 13.78	+ 0.78	- 62.62
Aug. 16.3	Groom. 944, S. P.	5	17 26 54.07	+ 5.53	- 49.14	Aug. 29.3	δ Ursæ Minoris . .	5	18 9 38.56	- 6.20	- 62.74
B. W. H.	α Ophiuchi . . .	11	17 30 33.24	+ 1.36	- 48.85	B. W. H.	θ Herculis . . .	11	17 53 29.38	+ 0.70	- 64.01
	ξ Serpentis . . .	11	17 31 59.56	+ 1.63	- 48.93		67 Ophiuchi . . .	13	17 56 6.63	+ 0.98	- 63.78
	β Ophiuchi . . .	11	17 38 45.55	+ 1.42	- 48.90		72 Ophiuchi . . .	11	18 3 7.01	+ 0.94	- 63.96
	μ Herculis . . .	11	17 42 53.76	+ 1.22	- 48.84		σ Herculis . . .	13	18 4 15.04	+ 0.78	- 63.90
	67 Ophiuchi . . .	11	17 55 51.49	+ 1.45	- 48.93		22 (H) Camelop., S. P.	5	18 7 33.38	+ 1.89	- 64.46
	72 Ophiuchi . . .	11	18 2 51.71	+ 1.38	- 48.93		δ Ursæ Minoris . .	5	18 8 38.89	- 5.15	- 64.53
	σ Herculis . . .	13	18 3 59.78	+ 1.20	- 48.83		η Serpentis . . .	11	18 16 35.50	+ 1.03	- 63.91
	δ Ursæ Minoris . .	5	18 9 27.89	- 4.78	- 49.09		103 Herculis . . .	11	18 20 0.35	+ 0.84	- 64.03
							θ Herculis . . .	11	17 52 10.93	+ 0.78	+*14.34
Aug. 21.3	Groom. 944, S. P.	5	17 27 1.29	+ 5.10	- 54.53	Aug. 30.3	67 Ophiuchi . . .	11	17 54 48.34	+ 0.99	+ 14.47
B. W. H.	α Ophiuchi . . .	11	17 30 40.27	+ 0.89	- 54.47	B. W. H.	72 Ophiuchi . . .	11	18 1 48.64	+ 0.95	+ 14.38
	ξ Serpentis . . .	11	17 32 5.26	+ 1.39	- 54.45		σ Herculis . . .	13	18 2 56.69	+ 0.83	+ 14.38
	β Ophiuchi . . .	11	17 38 51.34	+ 1.21	- 54.55		δ Ursæ Minoris . .	5	18 8 18.15	- 3.54	+ 14.18
	μ Herculis . . .	11	17 42 59.50	+ 1.03	- 54.48		η Serpentis . . .	11	18 15 17.17	+ 1.03	+ 14.11
	ψ^1 Draconis . . .	5	17 44 51.80	+ 0.08	- 54.47		23 (H) Camelop., S. P.	9	18 26 49.97	+ 2.39	+ 14.12
	θ Herculis . . .	11	17 53 19.90	+ 0.94	- 54.60		1 Aquilæ	11	18 28 53.19	+ 1.06	+ 14.37
	67 Ophiuchi . . .	11	17 55 57.22	+ 1.23	- 54.50		α Lyrae	21	18 32 55.27	+ 0.76	+ 14.43
	72 Ophiuchi . . .	11	18 2 57.44	+ 1.18	- 54.52		δ Ursæ Minoris . .	5	18 8 19.26	- 5.35	+ 13.61
	σ Herculis . . .	13	18 4 5.59	+ 1.01	- 54.53		η Serpentis . . .	11	18 15 16.71	+ 1.12	+ 14.73
							109 Herculis . . .	11	18 18 41.59	+ 0.91	+ 14.59
Aug. 22.3	Groom. 944, S. P.	5	17 27 2.40	+ 5.74	- 55.99	Sept. 2.3	1 Aquilæ	11	18 28 52.73	+ 1.16	+ 14.69
L. C. H.	α Ophiuchi . . .	11	17 30 40.27	+ 0.89	- 55.49	L. C. H.	α Lyrae	11	18 32 54.95	+ 0.73	+ 14.71
	ξ Serpentis . . .	11	17 32 6.53	+ 1.12	- 55.47		110 Herculis . . .	11	18 40 36.67	+ 0.92	+ 14.59
	β Ophiuchi . . .	11	17 38 52.49	+ 0.95	- 55.45		51 (H) Cephei, S. P.	5	18 47 19.71	+ 8.69	+ 13.52
	μ Herculis . . .	11	17 43 0.72	+ 0.75	- 55.44		θ Serpentis . . .	11	18 50 25.20	+ 1.05	+ 14.66
	θ Herculis . . .	11	17 53 21.10	+ 0.66	- 55.54		γ Lyrae	11	18 54 31.58	+ 0.80	+ 14.58
	67 Ophiuchi . . .	11	17 55 58.40	+ 0.97	- 55.44						
	72 Ophiuchi . . .	11	18 2 58.70	+ 0.91	- 55.53						
	σ Herculis . . .	13	18 4 6.80	+ 0.74	- 55.49						
	δ Ursæ Minoris . .	5	18 9 33.77	- 5.98	- 56.03						

* Clock corrections from Kessel's clock. East transit clock stopped for repairs.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Sept. 5.4 B. W. H.	γ Sagittæ	11	19 53 59.88	+ 0.97	— *12.26	Sept. 24.4 B. W. H.	ϵ Delphini	11	20 28 29.80	+ 0.75	— 36.84
	τ Aquilæ	11	19 58 53.34	+ 1.08	— 12.18		32 Vulpeculæ	10	20 50 25.61	+ 0.57	— 36.90
	θ Aquilæ	11	20 5 44.78	+ 1.14	— 12.26		12-Yr. Cat. 1879.	4	20 53 22.16	— 1.62	— 37.18
	24 Vulpeculæ	8	20 12 12.96	+ 0.91	— 12.22		61 ¹ Cygni	11	21 2 31.55	+ 0.43	— 36.93
	κ Cephei	5	20 12 56.51	— 1.11	— 11.26		ν Aquarii	8	21 4 7.69	+ 0.99	— 36.89
	γ Cygni	11	20 18 26.39	+ 0.71	— 12.22		ζ Cygni	11	21 8 48.85	+ 0.54	— 37.05
Sept. 9.4 B. W. H.	α Aquilæ	11	19 45 36.18	+ 1.16	— 16.22		τ Cygni	8	21 10 58.09	+ 0.43	— 37.01
	β Aquilæ	11	19 50 5.73	+ 1.19	— 16.22		1 Pegassi	11	21 17 32.98	+ 0.65	— 37.05
	τ Aquilæ	11	19 58 57.19	+ 1.17	— 16.16		1 (H) Draconis, S. P.	5	21 21 33.55	+ 3.38	— 37.17
	θ Aquilæ	11	20 5 48.68	+ 1.26	— 16.33		β Aquarii	11	21 26 18.10	+ 0.93	— 37.00
	α^2 Capricorni	13	20 12 7.49	+ 1.40	— 16.26	Sept. 26.3 B. W. H.	β Cygni	11	19 26 53.64	+ 0.61	— 40.51
	κ Cephei	6	20 13 0.05	— 0.98	— 16.24		κ Aquilæ	11	19 31 33.15	+ 0.90	— 40.36
	γ Cygni	5	20 18 30.18	+ 0.78	— 16.15		λ Ursæ Minoris	5	19 36 40.83	— 15.14	— 40.49
	ϵ Delphini	11	20 28 9.08	+ 1.14	— 16.32		γ Aquilæ	11	19 41 37.45	+ 0.76	— 40.43
Sept. 12.3 B. W. H.	β Lyræ	13	18 46 15.80	+ 1.07	— 18.69		δ Sagittæ	11	19 43 5.11	+ 0.69	— 40.57
	51 (H) Cephei, S. P.	5	18 47 52.05	+ 13.81	— 19.19		α Aquilæ	11	19 46 0.50	+ 0.77	— 40.41
	50 Draconis	2	18 50 20.36	— 0.92	— 19.22		Groom. 1374, S. P.	5	19 47 26.38	+ 1.61	— 40.59
	θ Serpentis	5	18 50 58.01	+ 1.49	— 18.76		β Aquilæ	11	19 50 30.20	+ 0.78	— 40.53
	γ Lyræ	11	18 55 4.42	+ 1.08	— 18.75		γ Sagittæ	11	19 54 28.11	+ 0.68	— 40.53
	ι Lyræ	11	19 3 37.66	+ 1.03	— 18.76	Sept. 27.3 B. W. H.	κ Aquilæ	11	19 31 34.71	+ 0.91	— 41.95
	ω Aquilæ	11	19 12 52.69	+ 1.39	— 18.78		λ Ursæ Minoris	5	19 36 42.46	— 16.77	— 41.94
	δ Aquilæ	11	19 20 10.19	+ 1.51	— 18.78		γ Aquilæ	11	19 41 38.93	+ 0.76	— 41.93
Sept. 13.3 B. W. H.	110 Herculis	11	18 41 10.50	+ 0.88	— 19.41		δ Sagittæ	11	19 43 6.52	+ 0.69	— 41.99
	β Lyræ	8	18 46 16.78	+ 0.73	— 19.35		α Aquilæ	11	19 46 1.94	+ 0.77	— 41.87
	51 (H) Cephei, S. P.	5	18 47 58.12	+ 8.90	— 19.79		Groom. 1374, S. P.	5	19 47 27.66	+ 1.72	— 41.89
	50 Draconis	5	18 50 20.52	— 0.61	— 19.78		β Aquilæ	11	19 50 31.60	+ 0.79	— 41.96
	γ Lyræ	11	18 55 5.42	+ 0.74	— 19.43		γ Sagittæ	11	19 54 29.58	+ 0.69	— 42.02
	ζ Aquilæ	11	19 0 35.81	+ 0.95	— 19.40	Sept. 28.3 B. W. H.	κ Aquilæ	11	19 30 36.38	+ 0.71	— 43.43
	ι Lyræ	11	19 3 38.66	+ 0.70	— 19.45		λ Ursæ Minoris	5	19 36 42.14	— 16.36	— 43.51
	ω Aquilæ	11	19 12 53.70	+ 0.98	— 19.40		δ Sagittæ	11	19 43 8.20	+ 0.49	— 43.49
Sept. 14.3 B. W. H.	50 Draconis	5	18 50 21.58	— 0.82	— 20.72		α Aquilæ	11	19 46 3.66	+ 0.57	— 43.40
	ζ Aquilæ	11	19 0 37.08	+ 1.04	— 20.77		Groom. 1374, S. P.	5	19 47 29.80	+ 1.49	— 43.71
	ι Lyræ	11	19 3 39.93	+ 0.75	— 20.79	Sept. 29.3 B. W. H.	ϵ Draconis	5	19 49 20.79	— 1.03	— 45.52
	25 (H) Camelop. S. P.	5	19 7 45.37	+ 4.60	— 20.68		β Aquilæ	11	19 50 35.10	+ 0.51	— 45.21
	ω Aquilæ	11	19 12 55.02	+ 1.06	— 20.82		γ Sagittæ	11	19 54 33.03	+ 0.36	— 45.18
	δ Aquilæ	11	19 20 12.56	+ 1.17	— 20.84		τ Aquilæ	11	19 59 26.54	+ 0.51	— 45.15
	β Cygni	13	19 26 33.93	+ 0.86	— 20.81		θ Aquilæ	11	20 6 17.91	+ 0.61	— 45.17
	κ Aquilæ	11	19 31 13.38	+ 1.30	— 20.80		Bradley 1147, S. P.	5	20 6 10.79	+ 2.55	— 45.52
Sept. 19.3 B. W. H.	β Cygni	11	19 26 41.17	+ 0.90	— 28.19		24 Vulpeculæ	11	20 12 46.37	+ 0.29	— 45.39
	κ Aquilæ	11	19 31 20.64	+ 1.28	— 28.12	Sept. 30.3 B. W. H.	β Sagittæ	11	19 36 48.89	+ 0.52	— 46.76
	λ Ursæ Minoris	5	19 36 42.00	— 19.98	— 28.15		γ Aquilæ	11	19 41 43.85	+ 0.61	— 46.75
	γ Aquilæ	11	19 41 24.94	+ 1.09	— 28.14		δ Sagittæ	16	19 43 11.44	+ 0.50	— 46.78
	δ Aquilæ	11	19 42 52.55	+ 1.00	— 28.20		α Aquilæ	11	19 46 6.87	+ 0.62	— 46.70
	α Aquilæ	11	19 45 47.98	+ 1.10	— 28.11		ϵ Draconis	8	19 49 21.86	— 0.88	— 46.81
	Groom. 1374, S. P.	5	19 47 12.98	+ 2.24	— 28.46		β Aquilæ	11	19 50 36.46	+ 0.64	— 46.71
	β Aquilæ	11	19 50 17.58	+ 1.14	— 28.15		γ Sagittæ	11	19 54 34.51	+ 0.49	— 46.81
	γ Sagittæ	11	19 54 15.63	+ 0.99	— 28.19		τ Aquilæ	11	19 59 27.97	+ 0.64	— 46.72
	τ Aquilæ	11	19 59 9.10	+ 1.11	— 28.15		θ Aquilæ	11	20 6 19.40	+ 0.74	— 46.81
Sept. 21.3 B. W. H.	β Cygni	11	19 26 44.32	+ 0.83	— 31.31		α^2 Capricorni	11	20 12 38.26	+ 0.90	— 46.81
	κ Aquilæ	11	19 31 23.92	+ 1.18	— 31.33	Oct. 1.4 B. W. H.	Groom. 1586, S. P.	8	21 49 6.67	+ 1.68	— 48.60
	λ Ursæ Minoris	5	19 36 40.73	— 17.78	— 31.38		79 Draconis	8	21 52 21.32	— 0.36	— 48.60
	γ Aquilæ	11	19 41 28.08	+ 1.01	— 31.23		π Pegasi	13	22 5 51.28	+ 0.57	— 48.60
	δ Sagittæ	11	19 42 55.83	+ 0.92	— 31.43		γ Aquarii	11	22 16 42.30	+ 0.89	— 48.58
	α Aquilæ	11	19 45 51.11	+ 1.02	— 31.19		π Aquarii	11	22 20 23.50	+ 0.86	— 48.56
	Groom. 1374, S. P.	5	19 47 16.28	+ 2.02	— 31.36		σ Aquarii	11	22 25 33.18	+ 0.97	— 48.65
	β Aquilæ	11	14 50 20.75	+ 1.05	— 31.26		η Aquarii	11	22 30 26.19	+ 0.87	— 48.61
	γ Sagittæ	11	19 54 18.83	+ 0.92	— 31.35		10 Lacertæ	11	22 35 5.05	+ 0.51	— 48.71
Sept. 22.3 B. W. H.	β Cygni	11	19 26 46.30	+ 0.71	— 33.19		ζ Pegasi	11	22 36 42.87	+ 0.78	— 48.64
	κ Aquilæ	11	19 31 25.72	+ 1.06	— 33.03	Oct. 3.3 B. W. H.	Bradley 1147, S. P.	5	20 6 17.71	+ 2.52	— 52.00
	λ Ursæ Minoris	5	19 36 43.28	— 19.21	— 33.67		24 Vulpeculæ	11	20 12 52.24	+ 0.31	— 51.36
	γ Aquilæ	11	15 41 30.02	+ 0.89	— 33.06		ϵ Delphini	11	20 28 44.40	+ 0.47	— 51.30
	δ Sagittæ	11	19 42 57.62	+ 0.81	— 33.13		β Delphini	11	20 33 10.65	+ 0.43	— 51.46
	α Aquilæ	11	19 45 53.06	+ 0.90	— 33.03		α Delphini	11	20 35 18.94	+ 0.41	— 51.38
	Groom. 1374, S. P.	5	19 47 18.66	+ 1.99	— 33.61		ϵ Cygni	11	20 42 33.71	+ 0.17	— 51.23
	β Aquilæ	11	19 50 22.68	+ 0.94	— 33.11		μ Aquarii	11	20 47 29.29	+ 0.72	— 51.23
	γ Sagittæ	11	19 54 20.61	+ 0.80	— 33.04		32 Vulpeculæ	11	20 50 40.21	+ 0.26	— 57.34
							12-Yr. Cat. 1879.	5	20 53 36.92	— 2.56	— 52.02

* Clock set back one minute.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Oct. 4.3	ϵ Delphini	11	20 28 45.91	+ 0.52	— 52.88	Oct. 19.2	α Ophiuchi	11	17 30 0.39	+ 0.75	— 16.49
B. W. H.	β Delphini	11	20 32 12.02	+ 0.49	— 52.91	L. C. H.	β Ophiuchi	11	17 38 12.70	+ 0.81	— 16.49
	α Delphini	11	20 35 20.47	+ 0.48	— 53.00		μ Herculis	11	17 42 20.70	+ 0.65	— 16.52
	ϵ Cygni	11	20 42 35.33	+ 0.32	— 53.01		θ Herculis	11	17 52 40.85	+ 0.58	— 16.61
	λ Cygni	10	20 43 57.32	+ 0.30	— 53.03		67 Ophiuchi	8	17 55 18.52	+ 0.83	— 16.38
	μ Aquarii	11	20 47 30.97	+ 0.69	— 52.89		72 Ophiuchi	13	18 2 18.88	+ 0.78	— 16.58
	32 Vulpeculæ . . .	11	20 50 41.69	+ 0.38	— 52.96		σ Herculis	11	18 3 26.77	+ 0.64	— 16.58
	12-Yr. Cat. 1879	5	20 53 36.39	— 1.30	— 52.88		δ Ursæ Minoris . .	5	18 8 26.42	— 2.09	— 16.43
	σ^2 Ursæ Maj., s. p.	5	21 1 23.81	+ 1.14	— 52.90	Oct. 20.3	ζ Cygni	11	18 8 29.68	+ 0.17	— 17.98
	61 ¹ Cygni	11	21 2 47.55	+ 0.28	— 52.96	L. C. H.	α Equulei	11	21 10 32.83	+ 0.50	— 18.03
Oct. 5.3	ϵ Delphini	11	20 28 47.45	+ 0.64	— 54.55		1 Pegasi	11	21 17 13.96	+ 0.31	— 18.07
B. W. H.	β Delphini	11	20 33 13.60	+ 0.60	— 54.61		1 (H) Draconis, s. p.	5	21 21 17.83	+ 3.75	— 17.99
	α Delphini	11	20 35 22.00	+ 0.59	— 54.65		β Aquarii	11	21 25 59.01	+ 0.65	— 17.96
	ϵ Cygni	11	20 42 36.83	+ 0.39	— 54.60		β Cephei	5	21 27 34.02	— 1.03	— 17.99
	λ Cygni	11	20 43 58.92	+ 0.36	— 54.71		ξ Aquarii	13	21 32 6.62	+ 0.67	— 17.93
	μ Aquarii	11	20 47 32.48	+ 0.85	— 54.58		74 Cygni	8	21 32 47.47	+ 0.01	— 17.94
	32 Vulpeculæ . . .	11	20 50 43.26	+ 0.46	— 54.63		ϵ Pegasi	11	21 39 0.58	+ 0.44	— 17.94
	12-Yr. Cat. 1879	7	20 53 38.69	— 1.81	— 54.77	Oct. 21.3	ϵ Cygni	11	20 42 1.87	+ 0.04	— 19.62
	σ^2 Ursæ Maj., s. p.	12	21 1 25.34	+ 1.56	— 54.79	B. W. H.	λ Cygni	11	20 43 23.88	+ 0.01	— 19.67
	61 ¹ Cygni	13	21 2 49.22	+ 0.33	— 54.70		μ Aquarii	11	20 46 57.49	+ 0.54	— 19.52
Oct. 8.3	ϵ Cygni	6	20 42 42.06	+ 0.29	— 59.78		32 Vulpeculæ . . .	11	20 50 8.19	+ 0.12	— 19.52
B. W. H.	12-Yr. Cat. 1879	5	20 53 43.48	— 1.89	— 59.86		12-Yr. Cat. 1879	5	20 53 2.00	— 2.13	— 19.82
	61 ¹ Cygni	11	21 2 54.33	+ 0.23	— 59.77		σ^2 Ursæ Maj., s. p.	5	21 0 51.78	+ 1.13	— 19.81
	ν Aquarii	8	21 4 30.45	+ 0.78	— 59.62		61 ¹ Cygni	11	21 2 14.27	— 0.01	— 19.74
	ζ Cygni	11	21 9 11.61	+ 0.33	— 59.84		ν Aquarii	11	21 3 50.42	+ 0.57	— 19.58
	1 (H) Draconis, s. p.	5	21 21 58.32	+ 3.29	— 59.91		ζ Cygni	11	21 8 31.47	+ 0.09	— 19.71
	74 Cygni	12	21 33 29.38	+ 0.21	— 59.80		α Equulei	11	21 10 34.47	+ 0.37	— 19.56
Oct. 9.3	ϵ Delphini	11	20 28 54.43	+ 0.49	— 61.45	Oct. 24.3	1 (H) Draconis . .	5	21 21 24.47	+ 3.11	— 23.31
B. W. H.	β Delphini	11	20 23 20.54	+ 0.44	— 61.46	B. W. H.	β Aquarii	11	21 26 3.99	+ 0.59	— 22.93
	α Delphini	11	20 35 28.89	+ 0.42	— 61.44		ϵ Pegasi	11	21 39 5.56	+ 0.43	— 22.96
	ϵ Cygni	11	20 42 43.78	+ 0.14	— 61.38		16 Pegasi	11	21 48 22.73	+ 0.17	— 22.98
	λ Cygni	11	20 44 5.90	+ 0.09	— 61.49		79 Draconis	5	21 51 55.27	— 0.97	— 23.32
	μ Aquarii	11	20 47 39.42	+ 0.78	— 61.50		α Aquarii	11	22 0 26.32	+ 0.53	— 22.94
	32 Vulpeculæ . . .	11	20 50 50.21	+ 0.24	— 61.43		θ Pegasi	13	22 4 57.60	+ 0.47	— 23.00
	12-Yr. Cat. 1879	5	20 53 46.14	— 3.07	— 61.47		π Pegasi	8	22 5 25.77	+ 0.18	— 23.04
	σ^2 Ursæ Maj., s. p.	5	21 1 31.89	+ 1.88	— 61.46	Oct. 28.3	32 Vulpeculæ . . .	11	20 50 14.66	+ 0.25	— 26.25
Oct. 10.3	ϵ Cygni	11	20 42 45.39	+ 0.10	— 62.97	L. C. H.	12-Yr. Cat. 1879	5	20 53 7.45	— 2.39	— 25.96
B. W. H.	λ Cygni	11	20 44 7.40	+ 0.07	— 63.00		61 ¹ Cygni	11	21 2 20.65	+ 0.11	— 26.39
	32 Vulpeculæ . . .	11	20 50 51.78	+ 0.17	— 62.95		ζ Cygni	11	21 8 37.81	+ 0.22	— 26.32
	12-Yr. Cat. 1879	5	20 53 46.75	— 2.19	— 63.09		α Equulei	11	21 10 40.92	+ 0.53	— 26.28
	ζ Cygni	11	21 8 15.01	+ 0.14	— 63.09		1 Pegasi	11	21 17 22.09	+ 0.36	— 26.38
	α Equulei	11	21 11 18.00	+ 0.42	— 62.98		1 (H) Draconis, s. p.	5	21 21 27.18	+ 3.74	— 25.97
	1 Pegasi	11	21 17 59.08	+ 0.26	— 62.98		β Aquarii	11	21 26 7.18	+ 0.67	— 26.26
	1 (H) Draconis, s. p.	5	21 22 1.74	+ 3.30	— 63.04		ξ Aquarii	13	21 32 14.90	+ 0.69	— 26.34
Oct. 14.3	ζ Cygni	11	21 9 21.00	+ 0.15	— 69.16		74 Cygni	8	21 32 55.68	+ 0.08	— 26.39
L. C. H.	α Equulei	11	21 11 24.04	+ 0.42	— 69.07	Oct. 29.3	ξ Aquarii	13	21 32 15.96	+ 0.61	— 27.33
	1 Pegasi	11	21 18 5.25	+ 0.27	— 69.23	L. C. H.	74 Cygni	8	21 32 56.75	+ 0.03	— 27.44
	1 (H) Draconis, s. p.	5	21 22 8.50	+ 3.32	— 69.20		ϵ Pegasi	11	21 39 9.88	+ 0.41	— 27.34
	β Aquarii	11	21 26 50.32	+ 0.55	— 69.08		16 Pegasi	11	21 48 27.08	+ 0.22	— 27.45
	β Cephei	5	21 28 25.40	— 0.89	— 69.17		α Aquarii	11	22 0 30.70	+ 0.53	— 27.39
	ξ Aquarii	13	21 32 57.99	+ 0.57	— 69.11		θ Pegasi	11	22 5 1.96	+ 0.45	— 27.41
	74 Cygni	8	21 33 38.88	+ 0.01	— 69.22		24 Cephei	5	22 8 10.47	— 1.05	— 27.47
	ϵ Pegasi	11	21 39 51.92	+ 0.38	— 69.13		ν Aquarii	11	22 16 21.25	+ 0.54	— 27.48
Oct. 15.4	Groom. 1706, s. p.	5	22 51 3.58	+ 2.37	*— 11.06		π Aquarii	11	22 20 2.44	+ 0.51	— 27.45
	β Pegasi	13	22 58 33.63	+ 0.27	— 10.66	Oct. 30.2	9 (H) Draconis, s. p.	5	22 25 58.21	+ 2.15	— 27.46
	α Pegasi	13	22 59 23.56	+ 0.42	— 10.62	L. C. H.	72 Ophiuchi	13	18 2 31.19	+ 0.39	— 28.65
	π Cephei	5	23 4 37.90	— 1.13	— 11.09		σ Herculis	11	18 3 39.15	+ 0.20	— 28.71
	ϕ Aquarii	11	23 8 43.74	+ 0.64	— 10.63		η Serpentis	11	18 15 59.77	+ 0.51	— 28.67
Oct. 17.3	12-Yr. Cat. 1879	5	20 52 56.32	— 1.87	— 13.87		109 Herculis	11	18 19 24.45	+ 0.28	— 28.75
L. C. H.	61 ¹ Cygni	11	21 2 8.00	+ 0.27	— 13.67		χ Draconis	5	18 23 31.46	— 0.83	— 29.00
	ζ Cygni	11	21 8 25.25	+ 0.38	— 13.70		1 Aquilæ	8	18 29 35.70	+ 0.57	— 28.64
	α Equulei	11	21 10 28.28	+ 0.65	— 13.59		α Lyre	11	18 33 37.60	+ 0.09	— 28.74
	1 Pegasi	11	21 17 9.38	+ 0.49	— 13.63		110 Herculis	11	18 41 19.58	+ 0.29	— 28.79
	1 (H) Draconis, s. p.	5	21 21 13.66	+ 3.33	— 13.89	Oct. 31.3	51 (H) Cephei, s. p.	5	18 48 33.35	+ 7.51	— 29.00
	β Aquarii	11	21 25 54.61	+ 0.78	— 13.64	L. C. H.	α Aquarii	11	22 0 33.28	+ 0.52	— 29.99
	ξ Aquarii	13	21 32 2.19	+ 0.80	— 13.58		θ Pegasi	11	22 5 4.52	+ 0.45	— 30.00
	74 Cygni	8	21 32 42.94	+ 0.24	— 13.57		π Pegasi	8	22 5 32.63	+ 0.19	— 30.03
							γ Aquarii	11	22 16 23.77	+ 0.53	— 30.01
							π Aquarii	11	22 20 4.93	+ 0.50	— 29.95
							226 (B) Cephei . .	5	22 30 53.18	— 1.04	— 30.02
							ζ Pegasi	11	22 36 24.36	+ 0.41	— 30.06

*Clock set back one minute.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS			
				Instrument	Clock					Instrument	Clock		
1888. Nov. 1.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi α Pegasi	5 13 11 11 11 5 11 8	h. m. s. 22 30 54.48 22 34 47.43 22 36 25.35 22 38 18.23 22 41 41.18 22 51 25.49 22 58 53.92 22 59 43.87	— + + + + + + +	s. 1.12 0.20 0.53 0.31 0.39 2.30 0.33 0.48	— — — — — — — —	1888. Nov. 13.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi α Pegasi	5 11 11 11 11 5 13 8	h. m. s. 22 31 6.49 22 34 59.45 22 36 37.32 22 38 30.24 22 41 53.21 22 51 37.78 22 59 5.98 22 59 55.88	— + + + + + + +	s. 1.96 0.06 0.54 0.22 0.34 3.40 0.26 0.47	— — — — — — — —
Nov. 3.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi α Pegasi	5 11 11 11 11 5 13 8	22 30 55.98 22 34 48.93 22 36 26.80 22 38 19.68 22 41 42.64 22 51 26.61 22 58 55.42 22 59 45.37	— + + + + + + +	— — — — — — — —	Nov. 20.3 L. C. H.	π Cephei τ Pegasi κ Piscium θ Piscium 70 Pegasi λ Draconis ι Piscium	5 11 13 11 11 3 11	23 5 18.24 23 15 59.00 23 22 4.28 23 23 10.15 23 24 22.60 23 25 33.06 23 35 4.39	— + + + + + +	— — — — — — —		
Nov. 4.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi α Pegasi	5 11 11 11 11 5 13 8	22 30 56.74 22 34 50.06 22 36 28.05 22 38 20.85 22 41 43.89 22 51 28.54 22 58 56.62 22 59 46.56	— + + + + + + +	— — — — — — — —	Nov. 21.3 L. C. H.	Groom. 1706, S. P. . β Pegasi α Pegasi π Cephei τ Pegasi κ Piscium θ Piscium 70 Pegasi	5 13 8 5 11 13 11 11	22 51 46.34 22 59 15.35 23 0 5.21 23 5 19.21 23 16 0.28 23 22 5.61 23 23 11.43 23 24 23.85	— — + — — + + +	— — — — — — — —		
Nov. 5.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi α Pegasi	5 11 11 11 11 5 13 8	22 30 57.86 22 34 51.34 22 36 29.26 22 38 22.10 22 41 45.17 22 51 29.94 22 58 57.78 22 59 47.80	— + + + + + + +	— — — — — — — —	Nov. 22.3 L. C. H.	Groom. 1706, S. P. . β Pegasi α Pegasi π Cephei τ Pegasi κ Piscium θ Piscium 70 Pegasi	5 13 8 5 11 13 11 8	22 51 48.16 22 59 16.13 23 0 5.93 23 5 19.67 23 16 1.04 23 22 6.43 23 23 12.25 23 24 24.62	— — + — — + + +	— — — — — — — —		
Nov. 6.2 L. C. H.	1 Aquilæ α Lyrae 110 Herculis β Lyrae γ Lyrae ζ Aquilæ τ Draconis δ Aquilæ	11 11 11 11 11 11 5 11	18 29 42.73 18 33 44.47 18 41 26.56 18 46 32.65 18 55 21.21 19 0 51.95 19 18 16.19 19 20 27.35	— + + + + + — +	— — — — — — — —	Nov. 23.4 L. C. H.	f Piscium α Ursæ Minoris . . . Groom. 2001, S. P. . η Piscium π Piscium ν Piscium ο Piscium β Arietis	11 5 5 11 11 11 11 11	1 12 58.05 1 20 30.87 1 24 4.72 1 26 26.67 1 32 6.83 1 36 33.12 1 40 25.84 1 49 24.74	— — + — + + + —	— — — — — — — —		
Nov. 10.4 L. C. H.	φ Pegasi Groom. 4163 ω Piscium 33 Piscium α Andromedæ γ Pegasi 6 Ursæ Min. S. P. . . 44 Piscium	11 5 11 11 11 11 5 11	23 47 29.25 23 50 10.21 23 54 15.16 0 0 17.51 0 3 18.12 0 8 9.96 0 13 58.46 0 20 21.38	— — + + + + + +	— — — — — — — —	Nov. 29.9 L. C. H.	τ Bootis η Bootis α Draconis κ Virginis α Bootis γ Bootis	11 11 5 3 11 11	13 42 57.56 13 50 22.28 14 2 21.77 14 7 56.14 14 11 34.16 14 28 35.00	— + — + + —	— — — — — —		
Nov. 11.3 L. C. H.	226 (B) Cephei . . . 10 Lacertæ ζ Pegasi η Pegasi λ Pegasi Groom. 1706, S. P. . β Pegasi σ Pegasi	5 11 11 11 11 5 13 8	22 31 4.99 22 34 57.30 22 36 34.92 22 38 27.94 22 41 50.99 22 51 34.32 22 59 3.80 22 59 53.54	— — + — + + + +	— — — — — — — —	Dec. 2.3 L. C. H.	Groom. 1706, S. P. . β Pegasi α Pegasi π Cephei τ Pegasi κ Piscium θ Piscium 70 Pegasi	5 13 8 5 11 11 11 11	22 51 59.19 22 59 25.72 23 0 15.65 23 5 25.65 23 16 10.67 23 22 15.98 23 23 21.84 23 24 34.25	— — + — — + + +	— — — — — — — —		
Nov. 12.4 L. C. H.	φ Pegasi Groom. 4163 ω Piscium 33 Piscium α Andromedæ γ Pegasi 6 Ursæ Min. S. P. . . 44 Piscium	11 5 11 11 11 11 5 11	23 47 31.88 23 50 13.34 23 54 17.67 0 0 19.91 0 3 20.76 0 8 12.63 0 13 59.05 0 20 23.85	— — + + + + + +	— — — — — — — —	Dec. 3.3	ζ Andromedæ δ Piscium 32 ² (H) Camelop. S. P. μ Andromedæ β Andromedæ ν Piscium	11 11 5 11 11 11	0 42 31.05 0 43 58.65 0 49 5.22 0 51 39.96 1 4 35.42 1 14 26.00	— + + — — —	— — — — — —		
						Dec. 4.3 L. C. H.	δ Piscium 32 ² (H) Camelop. S. P. μ Andromedæ ε Piscium β Andromedæ ν Piscium α Ursæ Minoris . . . η Piscium	11 5 11 11 11 11 5 11	0 42 59.95 0 48 11.54 0 50 40.85 0 57 15.67 1 3 36.29 1 13 27.12 1 19 10.42 1 25 37.60	— + — — — — — —	*— — — — — — — —		

* Clock set back one minute.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Dec. 5.4	50 Cassiopeæ . . .	5	1 53 32.77	— 1.44	+*28.17	Dec. 20.3	ζ Andromedæ . . .	11	0 41 47.87	+ 0.14	— 21.44
L. C. H.	α Arietis . . .	11	2 0 26.34	— 0.19	+ 28.60	L. C. H.	δ Piscium . . .	11	0 43 15.87	+ 0.11	— 21.40
	ξ ¹ Ceti . . .	11	2 5 38.13	— 0.03	+ 28.66		32 ² (H) Camelop., S.P.	5	0 48 37.95	— 2.68	— 21.66
	4 Ursæ Min., S.P.	5	2 8 41.58	+ 1.84	+ 28.19		μ Andromedæ . . .	11	0 50 56.27	+ 0.19	— 21.37
	67 Ceti . . .	11	2 10 57.84	+ 0.15	+ 28.58		ε Piscium . . .	11	0 57 31.64	+ 0.11	— 21.53
	o Ceti . . .	11	2 13 15.34	+ 0.11	+ 28.63		β Andromedæ . . .	11	1 3 51.71	+ 0.18	— 21.32
	ξ ² Ceti . . .	8	2 21 46.62	— 0.03	+ 28.67		f Piscium . . .	11	1 12 25.10	+ 0.11	— 21.48
							v Piscium . . .	11	1 13 42.76	+ 0.15	— 21.51
							α Ursæ Minoris . . .	5	1 18 42.05	+ 11.72	— 21.64
Dec. 6.3	ζ Andromedæ . . .	11	0 41 34.72	— 0.45	— 7.53						
L. C. H.	δ Piscium . . .	11	0 43 2.53	— 0.26	— 7.54						
	32 ² (H) Camelop., S.P.	5	0 48 14.17	+ 4.04	— 7.44	Dec. 21.3	π Piscium . . .	11	1 31 34.62	+ 0.10	— 22.42
	μ Andromedæ . . .	11	0 50 43.51	— 0.65	— 7.57	L. C. H.	v Piscium . . .	11	1 36 1.01	+ 0.06	— 22.31
	ε Piscium . . .	11	0 57 18.11	— 0.26	— 7.49		o Piscium . . .	11	1 39 53.71	+ 0.08	— 22.34
	β Andromedæ . . .	8	1 3 38.75	— 0.61	— 7.39		β Andromedæ . . .	11	1 48 52.40	+ 0.16	— 22.48
	v Piscium . . .	11	1 13 29.61	— 0.49	— 7.57		50 Cassiopeæ . . .	5	1 54 20.23	+ 1.33	— 22.70
	α Ursæ Minoris . . .	5	1 19 11.85	— 21.12	— 7.29		α Arietis . . .	11	2 1 16.92	+ 0.17	— 22.44
							β Trianguli . . .	11	2 3 18.41	+ 0.27	— 22.55
Dec. 7.3	ζ Andromedæ . . .	11	0 41 34.77	+ 0.68	— 8.72		ξ ¹ Ceti . . .	11	2 7 29.21	+ 0.08	— 22.63
L. C. H.	δ Piscium . . .	11	0 43 2.67	+ 0.73	— 8.68		4 Ursæ Min., S.P.	5	2 9 38.02	— 2.43	— 22.69
	32 ² (H) Camelop., S.P.	5	0 48 19.31	— 0.35	— 8.70						
	μ Andromedæ . . .	11	0 50 43.32	+ 0.65	— 8.69	Dec. 22.3	ε Piscium . . .	11	0 57 33.50	— 0.01	— 23.29
	ε Piscium . . .	11	0 57 18.41	+ 0.73	— 8.78	L. C. H.	β Andromedæ . . .	11	1 3 53.81	— 0.01	— 23.26
	β Andromedæ . . .	11	1 3 38.82	+ 0.65	— 8.73		f Piscium . . .	11	1 12 27.06	— 0.01	— 23.34
	f Piscium . . .	11	1 12 11.85	+ 0.75	— 8.74		v Piscium . . .	11	1 13 44.83	— 0.01	— 23.44
	v Piscium . . .	11	1 13 29.59	+ 0.67	— 8.72		α Ursæ Minoris . . .	5	1 18 48.85	+ 4.93	— 23.65
	α Ursæ Minoris . . .	5	1 18 50.00	+ 1.16	— 8.54		Groom. 2001, S.P.	5	1 23 39.72	— 0.57	— 23.79
							η Piscium . . .	11	1 25 55.42	— 0.01	— 23.34
							π Piscium . . .	11	1 31 35.72	— 0.02	— 23.41
Dec. 9.3	π Andromedæ . . .	11	0 31 7.27	+ 0.59	— 11.27						
B. W. H.	δ Andromedæ . . .	11	0 33 33.65	+ 0.60	— 11.23						
	ζ Andromedæ . . .	8	0 41 37.24	+ 0.65	— 11.19	Dec. 23.3	η Aquarii . . .	11	22 30 1.75	— 0.01	— 24.21
	δ Piscium . . .	11	0 43 5.20	+ 0.76	— 11.25	B. W. H.	226 (B) Cephei . . .	8	22 30 40.49	+ 1.59	— 24.33
	32 ² (H) Camelop., S.P.	5	0 48 20.14	+ 2.34	— 11.13		ζ Pegasi . . .	11	22 36 18.18	+ 0.06	— 24.18
	μ Andromedæ . . .	11	0 50 45.90	+ 0.55	— 11.21		η Pegasi . . .	11	22 38 10.64	+ 0.20	— 24.30
	43 (H) Cephei . . .	5	0 54 2.08	+ 1.87	— 11.11		λ Pegasi . . .	11	22 41 33.86	+ 0.14	— 24.35
	ε Piscium . . .	10	0 57 20.83	+ 0.76	— 11.25		λ Aquarii . . .	11	22 47 12.18	— 0.04	— 24.28
							α Ursæ Maj., S.P.	5	22 57 16.86	— 0.99	— 24.33
Dec. 11.3	π Andromedæ . . .	11	0 31 9.70	+ 0.45	— 13.58		β Pegasi . . .	11	22 58 46.48	+ 0.18	— 24.38
B. W. H.	δ Andromedæ . . .	11	0 33 36.02	+ 0.42	— 13.45		α Pegasi . . .	11	22 59 36.82	+ 0.08	— 24.36
	ζ Andromedæ . . .	11	0 41 40.00	+ 0.34	— 13.67						
	δ Piscium . . .	11	0 43 8.15	+ 0.18	— 13.64	Dec. 24.2	η Aquarii . . .	11	22 30 2.65	+ 0.10	— 25.24
	32 ² (H) Camelop., S.P.	5	0 48 31.47	— 6.42	— 13.32	B. W. H.	ζ Pegasi . . .	11	22 36 19.14	+ 0.16	— 25.25
	μ Andromedæ . . .	11	0 50 48.28	+ 0.53	— 13.60		η Pegasi . . .	8	22 38 11.53	+ 0.29	— 25.30
	43 (H) Cephei . . .	5	0 53 53.26	+ 8.59	— 13.26		λ Pegasi . . .	13	22 41 34.73	+ 0.24	— 25.34
	ε Piscium . . .	13	0 57 23.62	+ 0.18	— 13.48		λ Aquarii . . .	11	22 46 13.02	+ 0.06	— 25.23
							α Ursæ Maj., S.P.	5	22 57 17.96	+ 0.85	— 25.51
Dec. 13.3	δ Andromedæ . . .	8	0 33 38.48	+ 0.23	— 15.74		β Pegasi . . .	11	22 58 47.39	+ 0.27	— 25.40
B. W. H.	ζ Andromedæ . . .	11	0 41 42.33	+ 0.17	— 15.85		α Pegasi . . .	8	22 59 37.65	+ 0.18	— 25.30
	δ Piscium . . .	11	0 43 10.44	+ 0.06	— 15.83		π Cephei . . .	5	23 4 44.85	+ 1.52	— 25.50
	32 ² (H) Camelop., S.P.	5	0 48 33.18	— 5.29	— 15.75						
	μ Andromedæ . . .	11	0 50 50.97	+ 0.31	— 16.09	Dec. 25.3	δ Piscium . . .	11	0 43 20.70	+ 0.17	— 26.34
	43 (H) Cephei . . .	5	0 53 57.07	+ 6.75	— 15.72	B. W. H.	32 ² (H) Camelop., S.P.	5	0 48 45.05	— 4.14	— 26.22
	ε Piscium . . .	11	0 57 26.21	+ 0.06	— 15.87		μ Andromedæ . . .	11	0 51 0.99	+ 0.40	— 26.39
							43 (H) Cephei . . .	5	0 54 5.49	+ 5.68	— 25.24
Dec. 14.3	ζ Andromedæ . . .	11	0 41 43.18	+ 0.17	— 16.71		ε Piscium . . .	11	0 57 36.38	+ 0.17	— 26.38
B. W. H.	δ Piscium . . .	11	0 43 11.36	+ 0.06	— 16.76		β Andromedæ . . .	11	1 3 56.50	+ 0.37	— 26.38
	32 ² (H) Camelop., S.P.	5	0 48 34.48	— 5.51	— 16.62		f Piscium . . .	11	1 12 29.89	+ 0.15	— 26.36
	μ Andromedæ . . .	11	0 50 51.64	+ 0.32	— 16.79		v Piscium . . .	13	1 13 47.47	+ 0.30	— 26.43
	43 (H) Cephei . . .	5	0 53 57.46	+ 7.04	— 16.65						
	ε Piscium . . .	11	0 57 27.10	+ 0.06	— 16.87	Dec. 26.3	ξ ² Ceti . . .	11	2 22 42.20	+ 0.23	— 27.30
	β Andromedæ . . .	11	1 3 46.95	+ 0.29	— 16.59	B. W. H.	36 (H) Cassiopeæ . . .	5	2 27 56.64	+ 1.49	— 27.40
							5 Ursæ Min., S.P.	4	2 28 11.45	— 1.85	— 27.41
Dec. 15.3	ζ Andromedæ . . .	11	0 41 44.05	+ 0.32	— 17.74		v Arietis . . .	11	2 32 57.70	+ 0.32	— 27.46
B. W. H.	δ Piscium . . .	11	0 43 12.23	+ 0.20	— 17.78		δ Ceti . . .	13	2 34 14.43	+ 0.18	— 27.28
	μ Andromedæ . . .	11	0 50 52.41	+ 0.49	— 17.74		γ Ceti . . .	11	2 37 59.83	+ 0.20	— 27.35
	43 (H) Cephei . . .	5	0 53 57.64	+ 7.73	— 17.77		μ Ceti . . .	13	2 39 23.42	+ 0.24	— 27.45
	ε Piscium . . .	13	0 57 27.91	+ 0.20	— 17.83						
	β Andromedæ . . .	11	1 3 48.05	+ 0.45	— 17.86	Dec. 27.2	ζ Pegasi . . .	11	22 35 21.36	+ 0.13	— 27.47
						B. W. H.	η Pegasi . . .	11	22 38 13.74	+ 0.25	— 27.51
Dec. 19.3	δ Piscium . . .	8	0 43 15.03	+ 0.14	— 20.56		λ Pegasi . . .	11	22 41 36.92	+ 0.20	— 27.53
L. C. H.	32 ² (H) Camelop., S.P.	5	1 48 36.93	— 3.05	— 20.49		π Cephei . . .	5	23 4 47.18	+ 1.39	— 27.92
	μ Andromedæ . . .	11	0 50 55.52	+ 0.24	— 20.66		φ Aquarii . . .	11	23 9 0.37	+ 0.05	— 27.45
	ε Piscium . . .	11	0 57 30.68	+ 0.14	— 20.58		τ Pegasi . . .	11	23 15 34.62	+ 0.20	— 27.54
	β Andromedæ . . .	11	1 3 50.92	+ 0.22	— 20.56		χ Piscium . . .	13	23 21 40.56	+ 0.08	— 27.50
	f Piscium . . .	11	1 12 24.24	+ 0.13	— 20.63		θ Piscium . . .	13	23 22 46.28	+ 0.11	— 27.48
	v Piscium . . .	11	1 13 41.90	+ 0.19	— 20.68		70 Pegasi . . .	13	23 23 58.50	+ 0.14	— 27.50
	α Ursæ Minoris . . .	5	1 18 40.00	+ 13.56	— 20.50		λ Draconis, S.F.	5	23 25 16.59	+ 1.15	— 27.93

* Kessel's clock.

DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS		DATE AND OBSERVER	OBJECT	THREADS	MEAN THREAD	CORRECTIONS	
				Instrument	Clock					Instrument	Clock
1888			h. m. s.	s.	s.	1888			h. m. s.	s.	s.
Dec. 28.2	β Pegasi	11	22 58 50.13	+ 0.21	— 28.13	Dec. 30.3	ζ Andromedæ . .	11	0 41 56.20	+ 0.30	— 30.06
B. W. H.	α Pegasi	8	22 59 40.53	+ 0.12	— 28.16	L. C. H.	δ Piscium	11	0 43 24.25	+ 0.19	— 29.97
	π Cephei	5	23 4 47.49	+ 1.42	— 28.34		32 ² (H)Camelop.s.p.	5	0 48 49.94	— 4.29	— 29.84
	τ Pegasi	11	23 15 35.24	+ 0.18	— 28.17		μ Andromedæ . .	11	0 51 4.42	+ 0.43	— 29.93
	χ Piscium	11	23 21 41.15	+ 0.06	— 28.08		ϵ Piscium	11	0 57 39.88	+ 0.19	— 29.95
	θ Piscium	11	23 22 46.94	+ 0.08	— 28.12		β Andromedæ . .	11	1 3 59.99	+ 0.40	— 29.98
	70 Pegasi	11	23 23 59.14	+ 0.11	— 28.13		f Piscium	11	1 12 33.50	+ 0.17	— 30.04
	λ Draconis, s. p. .	5	23 25 17.16	— 1.21	— 28.36		v Piscium	11	1 13 51.07	+ 0.32	— 30.12
Dec. 29.2	β Pegasi	13	22 58 51.05	+ 0.32	— 29.17		α Ursæ Minoris .	5	1 18 32.80	+ 20.07	— 29.87
B. W. H.	α Pegasi	7	22 59 41.42	+ 0.24	— 29.18						
	π Cephei	5	23 4 48.42	+ 1.46	— 29.38						
	τ Pegasi	11	23 15 36.20	+ 0.29	— 29.23						
	χ Piscium	11	23 21 42.15	+ 0.17	— 29.20						
	θ Piscium	8	23 22 47.86	+ 0.20	— 29.17						
	70 Pegasi	11	23 24 0.06	+ 0.23	— 29.18						
	λ Draconis, s. p. .	5	23 25 18.05	— 1.03	— 29.36						

26-INCH EQUATORIAL

OBSERVATIONS

1888

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Jan. 11	Σ 311 AB	120	1.8	.	63.726	64.397	.	212.0	.	3 A	3	H.	Par. 65°.5 Therm. 18°.3
	AC	110	2.0	.	66.640	61.555	.	225.8	.	3 A	2	H.	
	HYPERION	270	.	10 18.4	38.599	64.056	10 12.9	69.8	.	3 A	2	H.	
14	Σ 186	210	1.4	.	64.128	64.046	.	124.3	.	5 A	3	H.	
	Σ 311 AB	120	1.6	.	63.734	64.415	.	213.4	.	5 A	3	H.	
	AC	110	1.7	.	66.570	61.532	.	225.8	.	5 A	3	H.	
	Σ 333	220	1.9	.	63.927	64.190	.	134.0	.	5 A	3	H.	
	Σ 355	150	2.2	.	64.356	63.808	.	188.8	.	5 A	3	H.	
	Weisse 3 ^h 564	330	2.4	.	63.891	64.271	.	184.4	.	5 A	3	H.	Faint.
18	HYPERION	180	.	9 52.8	73.893	64.048	9 47.8	164.75	.	3 A	2	H.	Par. 65°.5 Therm. 22°
19	Σ 186	210	2.2	.	64.109	64.018	.	121.9	.	5 A	2	H.	
	Σ 311 AB	120	2.5	.	64.404	63.744	.	32.2	.	3 A	2	H.	
	AC	110	2.6	.	66.589	61.534	.	45.7	.	3 A	2	H.	
	Σ 333	190	2.8	.	63.974	64.212	.	133.3	.	3 A	2	H.	
	HYPERION	140	.	10 1.6	52.499	64.072	9 54.6	199.9	.	3 A	2	H.	
21	Σ 333	210	2.8	.	63.950	64.191	.	136.0	.	3 A	2	H.	
	Σ 355	150	3.1	.	64.360	63.805	.	189.9	.	3 A	2	H.	
	Weisse 3 ^h 564	330	3.5	.	64.263	63.917	.	182.9	.	3 A	2	H.	
	HYPERION	110	.	9 33.3	83.526	64.052	9 27.3	231.8	.	3 A	3	H.	
30	HYPERION	300	.	9 8.7	47.764	64.075	9 0.7	230.38	.	3 A	2	H.	Parallel 65°.5 Thermometer 16°.0 { Extremely faint for distance. Moonlight and haze. Par. 65°.5
Feb. 1	Σ 367	230	3.6	.	63.990	64.112	.	100.7	.	5 A	3	H.	
	Σ 380	60	3.8	.	63.938	64.186	.	84.7	.	5 A	3	H.	
	Σ 407	30	4.1	.	63.805	64.344	.	109.2	.	5 A	2	H.	
	Σ 518 BC	120	4.4	.	64.352	63.743	.	48.4	.	3 A	3	H.	
	AB	120	4.5	.	72.312	55.844	.	49.9	.	3 A	3	H.	
	AD	90	4.7	.	59.498	68.582	.	70.5	.	3 A	3	H.	
	Anonyma	150	4.9	.	64.295	63.845	.	177.5	.	3 A	3	H.	
	HYPERION	270	.	9 43.2	88.876	64.061	9 37.2	67.75	.	3 A	3	H.	
	Σ 367	230	3.2	.	64.132	63.996	.	102.6	.	5 A	3	H.	
	Σ 380	70	3.5	.	64.178	63.937	.	84.4	.	5 A	3	H.	
	Σ 407	50	3.8	.	63.782	64.348	.	109.3	.	3 A	2	H.	
	Σ 518 BC	110	4.0	.	63.749	64.417	.	47.8	.	3 A	3	H.	
	AB	110	4.2	.	72.327	55.855	.	49.8	.	3 A	3	H.	
	AD	90	4.4	.	59.540	68.552	.	70.7	.	3 A	3	H.	
	Anonyma	160	4.7	.	64.316	63.831	.	177.3	.	3 A	3	H.	
2	HYPERION	260	.	9 17.2	37.907	64.072	9 9.7	73.22	.	3 A	3	H.	Faint.
	SAT.: Equatorial diam.	163	.	9 54.0	61.906	66.178	.	.	.	3 A	2	H.	Faint, hazy.
	Dusky ring: Out. edge	.	.	10 3.0	67.099	61.017	.	.	.	3 A	2	H.	
	Ring: Cassini div	.	.	10 13.0	59.978	68.134	.	.	.	3 A	2	H.	
	HYPERION	180	.	9 2.1	74.132	64.068	8 56.1	152.68	.	3 A	2	H.	Very faint.
	Σ 367	230	3.7	.	64.115	63.990	.	101.9	.	5 A	3	H.	Parallel 65°.5 Faint.
	Σ 380	70	3.9	.	64.165	63.937	.	81.6	.	5 A	3	H.	
	Σ 407	50	4.1	.	63.801	64.341	.	106.3	.	3 A	3	H.	
	Σ 518 BC	110	4.4	.	63.801	64.361	.	48.0	.	3 A	3	H.	
	AD	85	4.6	.	68.564	59.564	.	71.1	.	3 A	3	H.	
	AB	110	4.7	.	55.800	72.299	.	49.85	.	3 A	3	H.	
	HYPERION	90	.	9 11.0	87.637	64.051	9 0.5	64.85	.	3 A	3	H.	
14	Σ 408	330	4.0	.	64.194	63.937	.	176.4	.	3 A	2	H.	
	Σ 518	110	4.5	.	64.386	63.775	.	49.0	.	3 A	3	H.	
	Σ 536	150	4.7	.	63.931	64.223	.	173.2	.	3 A	3	H.	

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Feb. 14	Σ 589	300	4.9	.	64.520	63.604	.	35.4	.	3 A	2	H.	Parallel 65°.5
	Σ 622	340	5.2	.	63.837	64.321	.	161.3	.	3 A	2	H.	
	ρ Orionis	6.	5.4	.	63.372	64.764	.	91.0	.	3 A	3	H.	
	HYPERION	80	.	9 9.4	40.152	64.055	8 49.9	71.38	.	3 A	2	H.	
15	Σ 408	300	4.1	.	63.962	64.212	.	177.1	.	3 A	2	H.	
	Σ 536	150	4.3	.	64.254	63.933	.	174.6	.	3 A	2	H.	
	Σ 589	300	4.5	.	63.596	64.524	.	36.0	.	3 A	2	H.	
	Σ 622	340	4.6	.	64.335	63.813	.	161.8	.	3 A	2	H.	
	ρ Orionis	60	4.8	.	63.350	64.748	.	91.0	.	3 A	2	H.	Parallel 65°.50 Therm. in dome 22°
	Rigel	210	5.0	.	65.066	63.134	.	134.0	.	3 A	2	H.	
	HYPERION	75	.	8 9.9	86.155	64.090	8 4.9	77.8	.	3 A	2	H.	
	HYPERION	60	.	10 31.4	46.396	64.061	10 24.9	88.22	.	3 A	2	H.	
17	Σ 408	340	4.2	.	63.970	64.212	.	176.0	.	3 A	3	H.	
	Σ 536	160	4.4	.	63.926	64.255	.	172.9	.	3 A	3	H.	
	Σ 589	300	4.6	.	63.600	64.514	.	35.5	.	3 A	3	H.	
	Σ 622	350	4.8	.	63.848	64.333	.	161.6	.	3 A	3	H.	
	ρ Orionis	60	4.9	.	63.366	64.740	.	89.5	.	3 A	2	H.	
	Rigel	200	5.1	.	65.086	63.088	.	133.2	.	3 A	2	H.	
	23 Orionis	25	5.4	.	60.843	67.267	.	127.0	.	3 A	2	H.	
	39 Eridani	150	4.2	.	63.440	64.754	.	185.5	.	3 A	3	H.	
18	Σ 535	330	4.4	.	64.228	63.914	.	181.2	.	3 A	3	H.	
	Anonyma	160	4.6	.	64.284	63.838	.	178.0	.	3 A	3	H.	
	Lalande 9065	340	4.8	.	64.449	63.723	.	170.2	.	3 A	2	H.	
	Lalande 9181	170	5.1	.	64.189	63.969	.	158.9	.	3 A	3	H.	
	Rigel	200	5.2	.	65.052	63.132	.	133.6	.	3 A	3	H.	Blurred.
	23 Orionis	30	5.4	.	60.839	67.274	.	127.0	.	3 A	3	H.	
	ζ Orionis	160	5.6	.	64.361	63.825	.	180.2	.	3 A	2	H.	
	HYPERION	10	.	8 7.4	55.972	64.053	8 0.4	138.88	.	3 A	3	H.	
22	39 Eridani	150	4.6	.	64.732	63.420	.	185.1	.	3 A	2	H.	
	Σ 535	340	4.8	.	63.911	64.225	.	181.3	.	3 A	2	H.	
	Lalande 9065	350	5.0	.	63.777	64.370	.	169.4	.	3 A	2	H.	
	Lalande 9181	0	5.2	.	64.174	63.960	.	156.1	.	3 A	2	H.	
	Rigel	200	5.4	.	65.089	63.109	.	132.9	.	3 A	2	H.	Blurred.
	39 Eridani	150	4.5	.	63.428	64.685	.	185.5	.	3 A	2	H.	
	Σ 535	340	4.7	.	64.218	63.929	.	180.5	.	3 A	2	H.	
	λ Orionis	50	4.9	.	63.624	64.519	.	109.3	.	3 A	2	H.	
23	Lalande 9065	350	5.1	.	64.401	63.749	.	169.6	.	3 A	3	H.	Cloudy.
	Lalande 9181	0	5.4	.	64.162	63.984	.	155.6	.	3 A	3	H.	
	OΣ 517	140	5.6	.	63.408	64.790	.	17.8	.	3 A	3	H.	
	λ Orionis	40	5.8	.	64.489	63.602	.	112.2	.	3 A	3	H.	
	σ Orionis AC	220	6.0	.	62.902	65.211	.	98.7	.	3 A	3	H.	Parallel 65°.50 Therm. in dome 25°. Strong moonlight.
	AB	80	6.2	.	65.335	62.738	.	70.6	.	3 A	3	H.	
	HYPERION	220	.	8 53.7	50.483	64.058	8 46.7	115.35	.	3 A	3	H.	
	Σ 518	110	5.3	.	63.758	64.370	.	45.9	.	3 A	3	H.	
Mar. 4	OΣ 517	140	5.5	.	64.818	63.424	.	16.7	.	3 A	3	H.	
	λ Orionis	40	5.7	.	63.616	64.510	.	111.2	.	3 A	3	H.	
	σ Orionis AC	240	5.9	.	65.206	62.906	.	98.3	.	3 A	2	H.	
	AB	80	6.0	.	62.772	65.334	.	70.8	.	3 A	2	H.	
6	λ Orionis	40	5.9	.	63.638	64.536	.	113.3	.	3 A	3	H.	
	ζ Orionis	150	6.1	.	64.345	63.805	.	177.4	.	3 A	3	H.	
	Lalande 11915	90	6.3	.	63.872	64.302	.	58.5	.	3 A	3	H.	
	11 Monocerotis AB	130	6.5	.	63.302	64.798	.	24.4	.	3 A	2	H.	
	BC	100	6.7	.	64.338	63.777	.	50.9	.	3 A	3	H.	{ A faint comp. 15th mag. s = 25'', p = 50°.
	HYPERION	90	.	8 12.5	87.548	64.054	8 6.5	68.75	.	3 A	3	H.	
	ζ Orionis	160	5.3	.	64.340	63.810	.	178.9	.	3 A	2	H.	
	Lalande 11915	95	5.7	.	63.847	64.275	.	59.8	.	3 A	3	H.	
7	11 Monocerotis AB	130	5.9	.	63.340	64.822	.	25.0	.	3 A	3	H.	
	BC	100	6.1	.	64.336	63.810	.	53.2	.	3 A	3	H.	
	OΣ 156	300	6.3	.	63.991	64.121	.	29.9	.	5 A	2	H.	
	HYPERION	80	.	8 14.0	41.693	64.054	8 8.0	75.48	.	3 A	2	H.	
8	η Orionis	90	5.4	.	63.932	64.176	.	66.2	.	3 A	2	H.	Parallel 65°.55
	Σ 735	350	5.8	.	68.048	60.110	.	163.0	.	3 A	3	H.	
	South 503	20	6.1	.	63.790	64.385	.	138.5	.	3 A	3	H.	
	OΣ 156	300	6.4	.	64.149	64.073	.	28.6	.	5 A	2	H.	
	HYPERION	75	.	8 16.5	83.291	64.052	8 10.0	83.7	.	3 A	2	H.	
	JAPETUS	70	.	8 26.0	81.616	64.052	8 21.5	94.48	.	3 A	2	H.	

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Mar. 9	Sirius	20	5.8	.	63.479	64.644	.	132.7	.	3 A	3	H.	Faint.
	η Orionis	90	6.0	.	64.165	63.949	.	66.7	.	3 A	2	H.	
	Σ 735	350	6.3	.	68.058	60.092	.	163.2	.	3 A	3	H.	
	South 503	20	6.5	.	63.772	64.362	.	138.8	.	3 A	3	H.	
	Lalande 13404	70	6.7	.	63.960	64.159	.	88.8	.	3 A	3	H.	
	Σ 1097	170	6.9	.	63.972	64.147	.	170.7	.	5 A	2	H.	
	HYPERION	55	.	8 2.5	49.463	64.056	7 57.0	96.18	.	3 A	3	H.	
	JAPETUS	50	.	8 13.0	50.485	64.056	8 8.5	102.95	.	3 A	3	H.	Parallel 65°.50
12	JAPETUS	350	.	7 46.0	56.234	64.042	7 42.5	180.08	.	3 A	2	H.	Very windy. Therm. in dome 21°.
14	HYPERION	270	.	7 24.5	85.724	64.071	7 18.5	63.18	.	3 A	2	H.	Windy and bad images.
15	η Orionis	90	6.0	.	63.944	64.166	.	71.2	.	3 A	3	H.	
	Lalande 13404	60	6.3	.	64.160	63.938	.	90.5	.	3 A	3	H.	
	Σ 1097	170	6.7	.	63.966	64.155	.	169.6	.	3 A	2	H.	
	Σ 1126	140	6.9	.	63.938	64.184	.	192.2	.	3 A	3	H.	
	HYPERION	265	.	7 40.4	39.745	61.055	7 34.4	69.52	.	3 A	3	H.	
	ζ Cancri AB	45	8.5	.	63.952	64.192	.	114.1	.	3 A	2	H.	
	$\frac{AB}{2}$ C	120	8.6	.	64.616	63.525	.	211.6	.	3 A	2	H.	Parallel 65°.50
17	HYPERION	250	.	8 28.4	88.068	64.053	8 22.9	81.45	.	3 A	3	H.	Parallel 65°.50
18	0Σ 175	340	6.4	.	64.129	63.983	.	185.7	.	3 A	3	H.	
	0Σ 179	240	6.7	.	64.708	63.363	.	101.4	.	3 A	3	H.	
	Σ 1126	140	6.9	.	63.938	64.184	.	193.4	.	3 A	2	H.	
	HYPERION	245	.	8 22.4	42.345	64.050	8 15.9	88.05	.	3 A	3	H.	
30	0Σ 175	340	7.3	.	64.146	64.005	.	179.5	.	5 A	2	H.	Strong south wind.
	0Σ 179	240	7.5	.	64.732	63.388	.	102.5	.	3 A	2	H.	
	Σ 1126	150	7.7	.	63.959	64.195	.	190.0	.	3 A	2	H.	
	HYPERION	60	.	7 29.1	48.089	64.058	7 22.6	89.9	.	3 A	3	H.	Faint.
	DEIMOS	120	.	12 27.1	69.141	64.070	12 16.1	32.6	.	3 A	2	H.	Faint. Par. 65°.50
Apr. 1	0Σ 175	330	7.4	.	64.140	63.997	.	179.0	.	5 A	2	H.	
	HYPERION	0	.	7 35.0	56.689	64.076	7 28.0	153.68	.	3 A	2	H.	Faint.
2	Σ 1187	50	7.8	.	64.266	63.869	.	105.1	.	3 A	3	H.	
	ζ Cancri AB	50	8.0	.	63.966	64.161	.	106.8	.	3 A	2	H.	
	$\frac{AB}{2}$ C	120	8.1	.	64.610	63.494	.	31.0	.	3 A	2	H.	
	ε Hydræ AB	240	8.3	.	63.738	64.406	.	107.8	.	3 A	2	H.	
	HYPERION	300	.	8 18.0	74.047	64.074	8 11.0	26.58	.	3 A	2	H.	
	Σ 1439	120	9.6	.	64.248	63.886	.	212.8	.	3 A	2	H.	Windy. Par. 65°.50
3	Σ 1187	50	7.7	.	64.279	63.860	.	104.8	.	3 A	3	H.	
	ζ Cancri AB	50	8.0	.	63.962	64.159	.	106.8	.	3 A	3	H.	
	$\frac{AB}{2}$ C	120	8.1	.	64.638	63.528	.	31.7	.	3 A	3	H.	
	ε Hydræ AB	220	8.4	.	63.732	64.380	.	107.5	.	3 A	3	H.	
	AC	190	8.5	.	66.065	62.058	.	141.6	.	3 A	3	H.	C= 15th mag.
	HYPERION	290	.	8 17.9	49.008	64.052	8 11.9	228.92	.	3 A	3	H.	
	Σ 1439	130	9.8	.	64.250	63.889	.	217.0	.	3 A	2	H.	
	ξ Ursæ Majoris	240	10.1	.	63.885	64.235	.	112.8	.	3 A	2	H.	Parallel 65°.50
4	TITAN.	340	.	7 39.9	56.521	71.579	7 33.4	191.88	.	3 A	3	H.	
	HYPERION	275	.	7 54.4	83.757	64.059	7 47.4	59.9	.	3 A	3	H.	Faint.
	Σ 1439	120	9.5	.	64.246	63.897	.	217.0	.	3 A	2	H.	Parallel 65°.50
	ξ Ursæ Majoris	220	9.9	.	63.893	64.215	.	113.4	.	3 A	2	H.	Windy.
	DEIMOS	120	.	12 52.4	59.020	64.063	12 41.4	37.4	.	3 A	2	H.	Hazy and satellite very faint.
6	Σ 1187	50	7.8	.	64.289	63.849	.	105.6	.	3 A	3	H.	
	ζ Cancri AB	50	8.1	.	63.964	64.158	.	108.1	.	3 A	2	H.	
	$\frac{AB}{2}$ C	120	8.2	.	64.620	63.475	.	213.2	.	3 A	2	H.	
	ε Hydræ AB	230	8.4	.	63.723	64.383	.	108.0	.	3 A	2	H.	
	HYPERION	265	.	7 45.9	40.131	64.054	7 35.9	253.05	.	3 A	2	H.	
	DEIMOS	300	.	11 28.4	69.361	64.054	11 19.1	211.38	.	3 A	3	H.	
7	Sirius	20	8.0	.	63.456	64.640	.	133.3	.	3 A	2	H.	Very faint. Dist. uncertain.
	ε Hydræ AB	230	8.3	.	64.386	63.705	.	108.9	.	3 A	3	H.	
	AC	190	8.5	.	66.100	62.112	.	141.5	.	3 A	3	H.	
	Σ 1356	95	8.7	.	63.993	64.117	.	58.6	.	5 A	2	H.	
	HYPERION	260	.	7 59.8	87.865	64.051	7 50.3	258.90	.	3 A	3	H.	
	TITAN-HYPERION	220	.	8 14.3	69.899	58.318	8 8.3	291.65	.	3 A	3	H.	
	ξ Ursæ Majoris	230	9.8	.	63.884	64.219	.	112.8	.	3 A	3	H.	
	Σ 1504	100	10.1	.	63.942	64.179	.	49.6	.	3 A	2	H.	
	PHOBOS	120	.	11 29.3	66.153	64.072	11 21.3	210.9	.	3 A	3	H.	Very faint.

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Apr. 8	0Σ 197	60	8.1	.	64.200	63.920	.	94.0	.	3 A	3	H.	
	Σ 1338	160	8.3	.	63.902	64.226	.	177.7	.	3 A	3	H.	
	0Σ 201	230	8.5	.	64.196	63.920	.	109.2	.	3 A	3	H.	
	Σ 1356	100	8.7	.	63.980	64.120	.	57.8	.	3 A	2	H.	
	HYPERION	250	.	7 51.8	42.145	64.052	7 44.8	264.78	.	3 A	2	H.	Faint.
	TITAN-HYPERION	200	.	8 6.3	60.097	68.004	7 58.8	305.9	.	3 A	2	H.	Faint.
	DEIMOS	130	.	10 12.3	58.919	64.068	10 4.3	204.80	.	3 A	3	H.	Parallel 65°.50
	PHOBOS	120	.	.	.	.	10 44.3	206.6	.	3 A	2	H.	Extremely faint.
11	DEIMOS	300	.	.	.	.	10 42.2	39.48	.	3 A	3	H.	Clock runs wild.
12	HYPERION	190	.	8 5.7	73.626	64.065	7 58.2	330.32	.	3 A	3	H.	
13	Sirius	20	8.5	.	63.530	64.663	.	130.7	.	3 A	3	H.	Extremely faint.
	Σ 1338	160	8.8	.	64.227	63.909	.	178.5	.	3 A	3	H.	
	0Σ 197	70	9.0	.	63.910	64.201	.	91.2	.	3 A	3	H.	
	0Σ 201	200	9.2	.	63.944	64.219	.	109.0	.	3 A	3	H.	
	ω Leonis	95	9.4	.	64.128	63.980	.	57.0	.	3 A	3	H.	
	ξ Ursæ Majoris	220	9.6	.	63.892	64.228	.	113.6	.	3 A	3	H.	
	Σ 1504	120	9.8	.	63.965	64.193	.	48.5	.	3 A	3	H.	
	DEIMOS	130	.	10 18.2	69.370	64.067	10 10.7	209.54	.	3 A	2	H.	
16	0Σ 197	60	9.3	.	64.198	63.922	.	90.2	.	3 A	3	H.	
	Σ 1356	100	9.5	.	64.114	63.988	.	56.9	.	3 A	2	H.	
	Σ 1504	120	9.7	.	63.950	64.151	.	50.2	.	3 A	2	H.	
	ξ Ursæ Majoris	220	9.9	.	63.884	64.192	.	112.8	.	3 A	2	H.	Parallel 65°.50
	DEIMOS	300	.	11 22.6	59.061	64.051	11 13.1	43.24	.	3 A	2	H.	{ Very faint. MARS blurred, and very unsteady.
17	Σ 1338	160	9.0	.	63.936	64.223	.	175.4	.	3 A	3	H.	
20	0Σ 201	220	9.3	.	63.921	64.195	.	108.1	.	3 A	2	H.	
	ξ Ursæ Majoris	220	9.8	.	64.236	63.856	.	113.3	.	3 A	3	H.	
	Σ 1517	280	10.1	.	64.011	64.122	.	237.0	.	5 A	3	H.	
	DEIMOS	300	.	9 7.5	58.673	64.057	9 0.5	209.00	.	3 A	2	H.	Faint. Par. 65°.50
24	ω Leonis	100	9.3	.	63.990	64.116	.	55.5	.	3 A	3	H.	
	0Σ 229	340	9.6	.	64.140	63.962	.	186.5	.	3 A	3	H.	
	ξ Ursæ Majoris	220	9.8	.	63.891	64.224	.	113.6	.	3 A	3	H.	
	Σ 1517	280	10.1	.	64.101	64.001	.	237.6	.	5 A	2	H.	
	0Σ 237	270	10.3	.	63.952	64.197	.	246.5	.	5 A	2	H.	
	Σ 1641	30	11.5	.	64.970	63.128	.	119.4	.	3 A	3	H.	
25	0Σ 229	330	9.5	.	63.957	64.158	.	185.8	.	3 A	2	H.	
	0Σ 237	270	9.8	.	64.218	63.930	.	247.5	.	3 A	2	H.	
	Σ 1641	30	10.1	.	64.982	63.131	.	119.8	.	3 A	2	H.	Parallel 65°.50
	DEIMOS	300	.	9 27.9	58.753	64.051	9 19.4	212.20	.	3 A	3	H.	Extremely faint. Moonlight.
26	0Σ 229	330	10.3	.	63.999	64.174	.	188.1	.	3 A	3	H.	Thin clouds.
	0Σ 237	270	10.6	.	63.946	64.163	.	245.4	.	3 A	3	H.	
	Σ 1555 AB	170	10.8	.	64.006	64.126	.	170.3	.	3 A	3	H.	
	$\frac{AB}{2}$ C	155	11.0	.	61.940	66.205	.	189.0	.	3 A	3	H.	
	Σ 1641	30	11.3	.	64.988	63.131	.	118.9	.	3 A	3	H.	
	γ Virginis	160	12.2	.	63.514	64.636	.	181.6	.	3 A	2	H.	
	PHOBOS	300	.	.	.	.	10 3.1	301.5	.	3 A	3	H.	Extremely faint.
27	Σ 1517	280	10.1	.	64.120	64.022	.	60.4	.	5 A	3	H.	
	Σ 1555 AB	160	10.4	.	64.018	64.120	.	167.3	.	5 A	3	H.	
	$\frac{AB}{2}$ C	150	10.5	.	61.944	66.183	.	189.0	.	5 A	3	H.	
	γ Virginis	150	12.2	.	64.630	63.502	.	180.0	.	3 A	2	H.	
28	TITAN	160	.	7 4.8	57.026	71.078	6 59.3	182.45	.	3 A	4	H.	
	Σ 1517	280	9.9	.	64.126	64.012	.	60.3	.	5 A	3	H.	
	Σ 1555 AB	160	10.2	.	64.024	64.137	.	170.6	.	5 A	3	H.	
	γ Virginis	150	11.5	.	63.516	64.605	.	181.2	.	3 A	2	H.	
	Σ 1703	270	11.9	.	62.234	65.866	.	56.3	.	3 A	2	H.	Parallel 65°.50
May 1	Σ 1643	40	10.6	.	64.254	63.880	.	111.6	.	3 A	3	H.	Clouds.
	γ Virginis	150	11.3	.	63.541	64.623	.	180.7	.	3 A	2	H.	Cloudy.
	Σ 1703	270	11.5	.	62.241	65.907	.	55.8	.	3 A	2	H.	
	61 Virginis	30	12.1	.	84.644	64.070	.	128.32	.	3 A	2	H.	Parallel 65°.50
	Σ 1785	240	12.3	.	64.225	63.918	.	103.1	.	3 A	2	H.	Clouds.
2	Σ 1643	40	10.2	.	63.887	64.257	.	110.7	.	3 A	3	H.	
	DEIMOS	120	.	9 1.2	69.260	64.066	8 53.2	207.86	.	3 A	3	H.	Faint.
	γ Virginis	150	12.2	.	63.500	64.612	.	181.2	.	3 A	2	H.	
	Σ 1703	280	12.4	.	62.245	65.870	.	56.2	.	3 A	3	H.	
	61 Virginis	30	12.7	.	43.502	64.066	.	128.32	.	3 A	3	H.	Parallel 65°.50
3	Σ 1643	40	10.3	.	63.900	64.264	.	110.2	.	3 A	3	H.	Windy. Clouds.

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
May 5	Σ 1643	40	10.3	.	64.282	63.893	.	111.2	.	3 A	3	H.	Parallel 65°.50 Extremely faint.
	Σ 1728	190	11.2	.	64.023	64.120	.	140.8	.	5 A	3	H.	
	Σ 1785	230	11.7	.	63.911	64.237	.	102.6	.	3 A	2	H.	
	61 Virginis	30	12.0	.	43.445	64.070	.	128.48	.	3 A	2	H.	
	DEIMOS	290	.	9 48.7	59.193	64.066	9 39.7	42.90	.	3 A	3	H.	
June 1	Σ 1728	190	12.5	.	64.041	64.134	.	142.9	.	5 A	3	H.	Parallel 65°.50
	Σ 1644	250	12.8	.	61.961	66.170	.	89.3	.	3 A	3	H.	
	Σ 1668	200	13.0	.	64.254	63.940	.	138.4	.	3 A	3	H.	
	Σ 1785	240	13.3	.	64.248	63.907	.	99.1	.	3 A	3	H.	
	Σ 1847	250	13.9	.	61.652	66.465	.	77.1	.	3 A	2	H.	
	Σ 1888	250	14.2	.	64.393	63.711	.	84.2	.	3 A	2	H.	
	Σ 1909	240	14.5	.	63.564	64.546	.	274.3	.	3 A	2	H.	
	Σ 1644	250	12.8	.	66.152	61.965	.	89.5	.	3 A	3	H.	
	Σ 1668	200	13.1	.	63.932	64.254	.	139.4	.	3 A	3	H.	
	Σ 1847	260	13.6	.	66.496	61.624	.	75.8	.	3 A	2	H.	
4	Σ 1888	250	13.8	.	63.740	64.406	.	82.5	.	3 A	2	H.	
	Σ 1909	240	14.1	.	64.566	63.570	.	274.3	.	3 A	2	H.	
	Σ 1668	200	13.0	.	63.930	64.257	.	138.9	.	3 A	3	H.	
	Σ 1909	240	13.6	.	63.593	64.574	.	275.1	.	3 A	2	H.	
5	Σ 1888	250	13.8	.	63.716	64.420	.	84.2	.	3 A	2	H.	
	σ Coronæ Borealis . . .	200	14.8	.	64.453	63.666	.	128.9	.	3 A	2	H.	
	Σ 1728	190	13.0	.	64.117	64.033	.	141.4	.	5 A	3	H.	
	25 Canum Venaticorum . .	140	13.3	.	64.008	64.160	.	188.2	.	5 A	3	H.	
6	Σ 1877	330	13.5	.	63.787	64.373	.	189.8	.	3 A	3	H.	Parallel 65°.50 Sky quite hazy.
	η Coronæ Borealis . . .	190	13.8	.	64.138	64.007	.	136.7	.	5 A	2	H.	
	μ ² Bootis	100	14.0	.	64.120	64.005	.	235.7	.	5 A	2	H.	
	ζ Coronæ Borealis . . .	310	14.2	.	63.451	64.695	.	213.0	.	5 A	2	H.	
	σ Coronæ Borealis . . .	200	14.4	.	64.460	63.670	.	128.9	.	3 A	3	H.	
	Σ 1877	330	13.3	.	63.788	64.350	.	189.4	.	3 A	2	H.	
9	η Coronæ Borealis . . .	190	13.6	.	64.132	64.004	.	141.1	.	5 A	3	H.	Parallel 65°.50
	μ ₂ Bootis	100	13.8	.	64.007	64.139	.	233.4	.	5 A	3	H.	
	ζ Coronæ Borealis . . .	330	14.0	.	63.430	64.706	.	213.4	.	3 A	3	H.	
	σ Coronæ Borealis . . .	200	14.2	.	64.444	63.668	.	128.9	.	3 A	3	H.	
	λ Ophiuchi	40	14.5	.	63.940	64.203	.	108.4	.	3 A	2	H.	
	Σ 1877	330	14.1	.	63.782	64.366	.	189.4	.	3 A	2	H.	
12	η Coronæ Borealis . . .	190	14.4	.	64.121	64.012	.	141.2	.	5 A	3	H.	Parallel 65°.5
	σ Coronæ Borealis . . .	200	15.3	.	63.680	64.474	.	129.0	.	3 A	2	H.	
	Σ 1877	330	13.8	.	64.370	63.801	.	188.7	.	3 A	2	H.	
13	η Coronæ Borealis . . .	190	14.0	.	64.012	64.122	.	140.9	.	5 A	2	H.	Parallel 65°.5
	μ ₂ Bootis	100	14.2	.	64.021	64.142	.	55.6	.	5 A	2	H.	
	ζ Coronæ Borealis . . .	300	14.4	.	63.442	64.712	.	32.4	.	3 A	2	H.	
15	25 Canum Venaticorum . .	150	13.3	.	64.142	63.999	.	189.2	.	5 A	3	H.	Parallel 65°.5
	η Coronæ Borealis . . .	200	13.6	.	64.128	63.986	.	139.2	.	5 A	3	H.	
	μ ₁ Bootis	100	13.8	.	64.006	64.124	.	237.2	.	5 A	3	H.	
	ζ Coronæ Borealis . . .	300	14.0	.	63.454	64.713	.	213.4	.	5 A	3	H.	
	λ Ophiuchi	45	15.3	.	64.189	63.921	.	109.8	.	5 A	3	H.	
19	λ Ophiuchi	40	15.2	.	63.945	64.188	.	109.2	.	3 A	3	H.	Some thin clouds; star images fair.
	ζ Herculis	80	15.5	.	64.226	63.918	.	74.3	.	3 A	3	H.	
20	λ Ophiuchi	50	15.3	.	64.207	63.932	.	107.3	.	3 A	2	H.	{ Images become blazing. Parallel 65°.5
July 2	λ Ophiuchi	50	15.1	.	64.219	63.931	.	109.2	.	3 A	3	H.	
	ζ Herculis	80	15.4	.	63.896	64.228	.	77.1	.	3 A	2	H.	{ Poor images of stars. Very much blurred.
3	ζ Herculis	80	14.6	.	64.242	63.941	.	254.6	.	3 A	2	H.	
	λ Ophiuchi	50	14.8	.	64.222	63.914	.	111.6	.	3 A	2	H.	Clouds.
6	ζ Herculis	80	14.9	.	64.219	63.907	.	77.3	.	3 A	2	H.	
13	ζ Herculis	80	15.3	.	64.236	63.934	.	79.2	.	3 A	2	H.	Parallel 65°.50
	λ Ophiuchi	45	15.5	.	63.929	64.213	.	110.9	.	3 A	2	H.	
14	ζ Herculis	80	15.1	.	63.934	64.213	.	78.4	.	3 A	3	H.	Parallel 65°.50
17	Σ 3105	40	15.9	.	64.021	64.113	.	117.6	.	5 A	3	H.	
	Σ 2120	250	16.6	.	63.432	64.696	.	88.4	.	5 A	3	H.	
	Σ 2173	170	16.8	.	64.142	64.040	.	171.6	.	5 A	3	H.	
	70 Ophiuchi	350	17.5	.	64.296	63.872	.	163.2	.	3 A	2	H.	
	τ Ophiuchi	240	17.7	.	64.249	63.885	.	82.6	.	3 A	2	H.	
18	Σ 3105	40	16.4	.	64.114	64.023	.	115.0	.	5 A	3	H.	Clouds.
	Σ 2120	250	16.6	.	63.453	64.690	.	89.3	.	5 A	3	H.	
	Σ 2173	170	16.8	.	64.145	64.033	.	171.5	.	5 A	3	H.	

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
July 21	Σ 3105	40	16.0	. .	64.120	64.030	. .	112.4	. .	5 A	3	H.	Parallel 65°.5
	Σ 2120	250	16.2	. .	63.452	64.686	. .	87.1	. .	5 A	3	H.	
	Σ 2173	170	16.5	. .	64.138	64.036	. .	170.3	. .	5 A	3	H.	
	70 Ophiuchi	350	17.1	. .	64.284	63.882	. .	161.7	. .	5 A	3	H.	
	τ Ophiuchi	250	17.3	. .	63.902	64.223	. .	82.5	. .	5 A	3	H.	
23	ξ Scorpii AB	20	16.0	. .	63.994	64.177	. .	134.8	. .	5 A	3	H.	
	AB 2 C	60	16.1	. .	63.341	64.786	. .	89.4	. .	5 A	3	H.	
	β Scorpii	20	16.3	. .	65.439	62.691	. .	131.1	. .	3 A	3	H.	
	70 Ophiuchi	350	17.3	. .	63.881	64.293	. .	162.2	. .	3 A	2	H.	
	τ Ophiuchi	250	17.5	. .	63.905	64.245	. .	81.7	. .	3 A	2	H.	
25	β Scorpii	25	15.7	. .	62.706	65.441	. .	130.0	. .	3 A	3	H.	
	ξ Scorpii AB	20	15.9	. .	64.195	63.991	. .	134.9	. .	3 A	3	H.	
	AB 2 C	60	16.0	. .	64.766	63.330	. .	91.0	. .	3 A	2	H.	
26	ν Scorpii AB	5	15.8	. .	64.026	64.134	. .	150.3	. .	5 A	3	H.	
	AB 2 C	350	15.9	. .	59.960	68.169	. .	179.2	. .	5 A	3	H.	
	CD	50	16.0	. .	63.869	64.277	. .	106.1	. .	5 A	3	H.	
	70 Ophiuchi	350	17.4	. .	63.884	64.275	. .	161.8	. .	3 A	3	H.	
	τ Ophiuchi	250	17.8	. .	64.236	63.910	. .	82.8	. .	3 A	3	H.	
28	ν Scorpii AB	5	16.0	. .	64.020	64.150	. .	151.4	. .	5 A	3	H.	Parallel 65°.5 Clouds.
	AB 2 C	340	16.2	. .	68.153	59.980	. .	179.0	. .	5 A	3	H.	
	CD	50	16.3	. .	64.260	63.885	. .	105.5	. .	5 A	3	H.	
Aug. 1	70 Ophiuchi	350	16.9	. .	64.272	63.863	. .	162.8	. .	5 A	2	H.	Parallel 65°.5 Temp. = 79°.0, and very damp.
	τ Ophiuchi	250	17.2	. .	64.232	63.872	. .	82.2	. .	3 A	2	H.	
2	36 Ophiuchi	200	17.1	. .	64.520	63.650	. .	138.0	. .	3 A	3	H.	Clouds.
	70 Ophiuchi	350	17.4	. .	63.890	64.288	. .	160.6	. .	5 A	3	H.	
	Σ 2456	10	17.8	. .	61.570	66.547	. .	149.4	. .	3 A	3	H.	
3	Σ 2107	260	16.5	. .	64.100	64.020	. .	81.9	. .	5 A	3	H.	
	36 Ophiuchi	200	16.7	. .	63.642	64.515	. .	138.5	. .	3 A	3	H.	
	Σ 2315	220	16.9	. .	64.096	64.040	. .	112.8	. .	6 A	3	H.	
	ε ₁ Lyrae	20	17.1	. .	63.762	64.376	. .	140.8	. .	5 A	3	H.	
	ε ₂ Lyrae	140	17.2	. .	64.296	63.826	. .	201.6	. .	5 A	3	H.	
	Σ 2306 A $\frac{BC}{2}$	220	17.8	. .	62.908	65.286	. .	115.2	. .	3 A	3	H.	
	BC	70	17.9	. .	64.164	64.016	. .	88.5	. .	5 A	3	H.	
	Σ 2456	10	18.1	. .	61.598	66.602	. .	149.4	. .	3 A	3	H.	
7	Σ 2107	250	16.7	. .	64.129	64.058	. .	81.0	. .	6 A	3	H.	
	Σ 2315	220	16.9	. .	64.124	64.064	. .	114.3	. .	6 A	3	H.	
	ε ₁ Lyrae	20	17.2	. .	63.788	64.417	. .	141.1	. .	3 A	3	H.	
	ε ₂ Lyrae	120	17.3	. .	64.306	63.864	. .	201.9	. .	3 A	3	H.	
	Σ 2306 A $\frac{BC}{2}$	220	18.0	. .	65.316	62.896	. .	115.2	. .	3 A	2	H.	
	BC	70	18.2	. .	64.014	64.178	. .	86.2	. .	3 A	2	H.	
	Σ 2488	330	18.5	. .	63.973	64.252	. .	185.6	. .	3 A	3	H.	
	Σ 2515	25	18.8	. .	62.912	65.295	. .	129.2	. .	3 A	3	H.	
10	μ ₁ Herculis	340	16.8	. .	64.137	64.065	. .	178.2	. .	5 A	2	H.	
	ε ₁ Lyrae	20	17.0	. .	63.780	64.392	. .	139.9	. .	3 A	3	H.	
	ε ₂ Lyrae	120	17.2	. .	63.869	64.347	. .	202.5	. .	3 A	3	H.	
	Σ 2488	330	17.8	. .	64.258	63.962	. .	186.2	. .	3 A	2	H.	
	Σ 2515	25	18.1	. .	65.291	62.897	. .	129.5	. .	3 A	3	H.	
	Σ 2524	100	18.4	. .	63.410	64.776	. .	55.5	. .	3 A	3	H.	
15	μ ₁ Herculis	340	17.1	. .	64.066	64.140	. .	177.0	. .	5 A	3	H.	Clouds.
	ε ₁ Lyrae	20	17.5	. .	63.790	64.409	. .	141.0	. .	5 A	3	H.	
	ε ₂ Lyrae	120	17.6	. .	63.870	64.330	. .	204.0	. .	5 A	3	H.	
	Σ 2524	100	17.9	. .	63.390	64.771	. .	55.2	. .	3 A	3	H.	
	Σ 2536	70	18.3	. .	63.899	64.269	. .	87.9	. .	3 A	3	H.	
	OΣ 375	160	18.5	. .	64.137	64.039	. .	187.2	. .	5 A	3	H.	
	A. C. 16	250	18.7	. .	64.134	64.046	. .	102.8	. .	5 A	3	H.	
	OΣ 395	110	18.9	. .	64.040	64.140	. .	235.2	. .	5 A	3	H.	
23	Σ 2666	240	19.1	. .	63.836	64.370	. .	271.6	. .	5 A	3	H.	
	Σ 2286	320	17.5	. .	63.837	64.359	. .	199.0	. .	3 A	3	H.	
	Σ 2536	70	17.9	. .	63.904	64.296	. .	88.9	. .	3 A	2	H.	
	Σ 2666	240	18.1	. .	63.822	64.362	. .	270.3	. .	3 A	2	H.	

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Aug. 24	μ_1 Herculis	340	17.4	.	64.125	64.045	.	172.6	.	5 A	3	H.	Hazy.
	Σ 2286	320	17.7	.	63.826	64.348	.	199.1	.	5 A	2	H.	
	Σ 2536	70	18.3	.	63.904	64.290	.	88.6	.	3 A	3	H.	
	$\text{O}\Sigma$ 375	150	18.6	.	64.037	64.145	.	186.5	.	5 A	2	H.	
	Σ 2666	240	18.8	.	63.846	64.362	.	270.4	.	3 A	2	H.	
25	μ_1 Herculis	340	17.5	.	64.061	64.145	.	168.4	.	5 A	3	H.	
	Σ 2286	320	17.7	.	64.358	63.852	.	197.3	.	3 A	3	H.	
	$\text{O}\Sigma$ 375	140	17.9	.	64.152	64.052	.	192.8	.	5 A	3	H.	
	A. C. 16	230	18.1	.	64.134	64.041	.	100.0	.	5 A	3	H.	
	$\text{O}\Sigma$ 395	100	18.3	.	64.150	64.023	.	236.1	.	5 A	2	H.	
	61 Cygni	120	18.9	.	61.998	66.209	.	214.2	.	3 A	2	H.	Parallel 65°.5 Blazing images.
28	$\text{O}\Sigma$ 543	130	17.6	.	64.196	63.986	.	205.1	.	5 A	2	H.	Cool, and images poor.
29	$\text{O}\Sigma$ 543	130	17.9	.	63.978	64.194	.	204.4	.	5 A	2	H.	Clouds. Right quadrant.
	A. C. 16	70	18.3	.	64.133	64.037	.	96.5	.	5 A	3	H.	
	$\text{O}\Sigma$ 395	100	18.5	.	64.011	64.146	.	234.6	.	5 A	3	H.	
Sept. 12	δ Cygni	320	18.5	.	64.218	63.946	.	197.5	.	5 A	2	H.	Parallel 65°.5 Clouds.
	$\text{O}\Sigma$ 387	0	18.8	.	64.136	64.030	.	157.6	.	5 A	2	H.	
	γ Delphini	270	19.8	.	65.203	62.964	.	65.8	.	3 A	3	H.	
14	δ Cygni	320	18.1	.	63.975	64.248	.	198.0	.	5 A	2	H.	
	$\text{O}\Sigma$ 387	0	18.3	.	64.146	64.036	.	156.1	.	5 A	2	H.	
	61 Cygni	120	19.4	.	61.994	66.181	.	214.7	.	3 A	3	H.	
	γ Delphini	270	19.7	.	65.204	62.972	.	65.2	.	3 A	3	H.	
	Σ 2779	180	20.0	.	65.858	62.310	.	153.5	.	3 A	3	H.	
	$\text{O}\Sigma$ 437	50	20.3	.	63.937	64.242	.	109.2	.	5 A	2	H.	
Oct. 3	δ Cygni	320	19.0	.	63.924	64.241	.	198.8	.	3 A	2	H.	
	$\text{O}\Sigma$ 387	350	19.2	.	64.034	64.143	.	162.5	.	3 A	2	H.	
	61 Cygni	120	19.5	.	62.005	66.214	.	215.1	.	3 A	2	H.	
	γ Delphini	270	19.7	.	65.197	62.979	.	65.4	.	3 A	2	H.	
	Σ 2779	180	20.0	.	62.308	65.858	.	153.3	.	3 A	2	H.	
	$\text{O}\Sigma$ 437	50	20.2	.	64.216	63.926	.	107.4	.	3 A	2	H.	Parallel 65°.5
4	δ Cygni	320	18.9	.	64.227	63.920	.	195.2	.	3 A	2	H.	
	$\text{O}\Sigma$ 387	0	19.1	.	64.020	64.128	.	160.8	.	3 A	2	H.	
	61 Cygni	120	19.3	.	66.226	61.990	.	214.2	.	3 A	2	H.	
	Σ 2779	180	19.5	.	62.320	65.859	.	153.4	.	3 A	2	H.	
	$\text{O}\Sigma$ 437	50	19.7	.	64.217	63.926	.	108.4	.	3 A	2	H.	
9	61 Cygni	120	19.5	.	66.178	61.955	.	214.45	.	3 A	2	H.	
	Σ 2824	300	19.8	.	62.858	65.260	.	215.0	.	3 A	2	H.	
30	61 Cygni	120	20.3	.	66.196	62.002	.	214.7	.	3 A	3	H.	
	Σ 2824	300	20.6	.	62.880	65.330	.	214.3	.	3 A	3	H.	
	Σ 2900 AB	180	20.9	.	64.251	63.895	.	158.9	.	3 A	2	H.	
	AC	340	21.1	.	57.613	70.595	.	188.2	.	3 A	3	H.	
	Σ 2910	330	21.3	.	63.513	64.626	.	173.8	.	3 A	2	H.	
	Σ 2928	130	22.6	.	64.480	63.640	.	199.2	.	3 A	2	H.	
Nov. 1	Σ 2824	300	20.7	.	65.332	62.868	.	217.2	.	3 A	3	H.	
	Σ 2900 AB	170	20.9	.	63.915	64.220	.	158.4	.	3 A	3	H.	
	AC	330	21.0	.	57.612	70.584	.	188.2	.	3 A	3	H.	
	Σ 2910	340	21.3	.	64.620	63.534	.	173.9	.	3 A	3	H.	
	ζ Aquarii	150	21.5	.	64.416	63.769	.	189.8	.	3 A	3	H.	
	Σ 2928	140	21.7	.	64.489	63.670	.	199.5	.	3 A	3	H.	Parallel 65°.5
5	Σ 2900 AB	180	22.1	.	63.916	64.270	.	155.9	.	3 A	3	H.	
	AC	340	22.3	.	57.583	70.562	.	188.2	.	3 A	3	H.	
	Σ 2928	140	23.2	.	64.490	63.647	.	21.1	.	3 A	2	H.	
	ζ Aquarii	330	23.4	.	64.398	63.726	.	12.4	.	3 A	2	H.	
	Σ 2943	120	23.7	.	66.781	61.312	.	39.9	.	3 A	2	H.	
6	Σ 2910	340	21.2	.	63.546	64.620	.	174.2	.	3 A	3	H.	
	ζ Aquarii	330	21.4	.	64.426	63.755	.	189.5	.	3 A	3	H.	
	Σ 2943	120	21.9	.	61.296	66.816	.	40.4	.	3 A	2	H.	
20	Σ 2828 AB	140	21.7	.	66.745	61.379	.	202.3	.	3 A	2	H.	Parallel 65°.5 A small comp. 10'' following B.
	BC	220	21.9	.	63.678	64.470	.	116.1	.	3 A	2	H.	
	Σ 2943	120	22.3	.	66.818	61.334	.	40.0	.	3 A	2	H.	
	Σ 2959	110	22.6	.	62.722	65.246	.	51.9	.	3 A	2	H.	
21	Σ 2828 AB	120	21.7	.	66.732	61.418	.	22.6	.	3 A	3	H.	
	BC	210	21.9	.	63.675	64.455	.	117.0	.	3 A	3	H.	
	Σ 2833	340	22.1	.	64.987	63.147	.	177.8	.	3 A	3	H.	
	Σ 2959	120	22.3	.	62.709	65.419	.	52.2	.	3 A	3	H.	
	$\text{O}\Sigma$ 500	320	22.5	.	61.115	64.017	.	192.8	.	5 A	3	H.	
	Σ 3062	300	22.8	.	64.214	63.914	.	194.6	.	5 A	2	H.	

DATE	OBJECT OBSERVED	EST'D POS. ANGLE	WASH'N TIME		MICROMETER		WASH'N MEAN TIME	POS.-CIRCLE VERNIERS		EYEPIECE	IMAGE	OBSERVER	REMARKS
			Sid.	Mean	I	II		I	II				
1888		°	h	h m	r	r	h m	°					
Nov. 22	Σ 2833	340	22.1	.	63.178	64.990	.	177.2	.	3 A	3	H.	
	0Σ 500	320	22.3	.	64.122	64.014	.	194.2	.	5 A	2	H.	
	0Σ 483	220	22.5	.	64.178	63.964	.	121.8	.	5 A	2	H.	
Dec. 1	Σ 2828 AB	140	22.5	.	66.749	61.399	.	22.2	.	3 A	2	H.	
	BC	230	22.7	.	63.700	64.442	.	116.3	.	3 A	2	H.	
	Σ 2833	340	22.9	.	63.151	64.990	.	176.9	.	3 A	2	H.	
5	0Σ 483	220	22.5	.	63.968	64.182	.	117.6	.	5 A	2	H.	Clouds.
7	0Σ 500	320	22.6	.	64.113	64.017	.	191.6	.	5 A	3	H.	
	85 Pegasi	150	22.9	.	64.150	64.001	.	212.1	.	5 A	2	H.	
	Σ 3062	320	23.2	.	64.195	63.967	.	196.2	.	5 A	2	H.	Clouds.
15	85 Pegasi	130	22.9	.	64.006	64.160	.	212.9	.	5 A	3	H.	
	Σ 3062	320	23.2	.	64.209	63.960	.	195.4	.	5 A	3	H.	
	η Cassiopeæ	190	23.4	.	63.584	64.573	.	154.5	.	5 A	3	H.	Parallel 65°.5
	λ Cassiopeæ	140	23.6	.	64.126	64.031	.	186.3	.	5 A	2	H.	Thin clouds.
19	0Σ 18	130	1.1	.	64.224	63.933	.	31.6	.	3 A	2	H.	
	τ Sculptoris	90	1.4	.	64.298	63.836	.	64.0	.	3 A	2	H.	Blurred.
	Σ 208	50	1.6	.	63.952	64.198	.	102.7	.	3 A	2	H.	
	Σ 360	140	1.9	.	63.905	64.267	.	199.4	.	3 A	2	H.	
	Σ 381	100	2.5	.	64.161	63.967	.	56.2	.	3 A	2	H.	Parallel 65°.5
20	85 Pegasi	120	23.3	.	64.179	63.982	.	209.1	.	5 A	2	H.	
	Σ 3062	320	23.6	.	64.226	63.929	.	198.1	.	3 A	2	H.	
	η Cassiopeæ	180	23.8	.	64.566	63.570	.	332.4	.	3 A	2	H.	
	λ Cassiopeæ	150	0.0	.	64.030	64.139	.	190.7	.	5 A	2	H.	
	0Σ 18	150	0.3	.	64.211	63.952	.	31.1	.	5 A	2	H.	
	Σ 208	50	0.5	.	63.966	64.186	.	101.2	.	5 A	2	H.	
	Σ 360	140	0.8	.	64.278	63.906	.	197.5	.	5 A	2	H.	Parallel 65°.5
	Σ 381	100	1.0	.	63.969	64.182	.	60.6	.	5 A	2	H.	Therm. in dome 28°.3
	τ Sculptoris	90	1.3	.	63.867	64.273	.	60.6	.	3 A	2	H.	Blurred.
22	η Cassiopeæ	180	23.8	.	63.594	64.572	.	330.7	.	3 A	3	H.	
	λ Cassiopeæ	150	0.0	.	64.142	64.050	.	190.4	.	5 A	3	H.	
	Σ 118	80	0.4	.	62.874	65.285	.	261.7	.	5 A	3	H.	
23	η Cassiopeæ	180	23.6	.	64.542	63.581	.	331.4	.	3 A	2	H.	
	Σ 118	80	23.9	.	62.872	65.284	.	261.4	.	3 A	2	H.	
	Σ 208	70	0.2	.	64.186	63.970	.	100.9	.	3 A	3	H.	Parallel 65°.5
24	Σ 2	0	23.7	.	64.117	64.045	.	332.4	.	5 A	2	H.	Not separated.
	Σ 13	90	23.9	.	64.002	64.146	.	246.0	.	5 A	2	H.	
	β Cassiopeæ	300	0.2	.	63.985	64.153	.	210.1	.	5 A	2	H.	
	Σ 186	250	0.4	.	64.131	64.024	.	116.5	.	5 A	2	H.	Blurred.
	Σ 360	140	0.7	.	64.255	63.894	.	197.9	.	5 A	2	H.	
	Σ 381	95	1.4	.	63.968	64.169	.	237.1	.	3 A	2	H.	Parallel 65°.5
25	Σ 2	0	23.7	.	64.050	64.110	.	331.4	.	6 A	2	H.	Elongated.
	Σ 13	90	23.9	.	64.144	63.971	.	246.5	.	5 A	2	H.	
	β Cassiopeæ	300	0.1	.	63.974	64.136	.	210.6	.	5 A	2	H.	
	Anonyma	300	0.3	.	58.101	69.996	.	183.55	.	5 A	3	H.	
	Σ 228	40	0.6	.	64.109	64.007	.	304.8	.	5 A	2	H.	
	Σ 186	230	0.8	.	64.112	64.020	.	122.7	.	5 A	3	H.	
28	Σ 13	90	0.0	.	64.021	64.159	.	246.4	.	5 A	2	H.	
	β Cassiopeæ	300	0.2	.	63.984	64.134	.	211.2	.	5 A	2	H.	Parallel 65°.5
	Σ 228	20	0.4	.	64.114	64.031	.	132.6	.	5 A	2	H.	Blurred.
	Σ 186	210	0.7	.	64.112	64.021	.	131.0	.	5 A	2	H.	Blurred.

RESULTS

OF

ASTRONOMICAL OBSERVATIONS

1888

TRANSIT CIRCLE NORTH-POLAR-DISTANCE CORRECTIONS

TO

AMERICAN-EPHEMERIS STARS

JANUARY 1 TO MARCH 19

1888

[NOTE.—The Right Ascension and North-Polar Distance of each star are taken from the *American Ephemeris* for 1888.]

α ANDROMEDÆ					POLARIS—Continued					ξ ¹ CETI					48 (H) CEPHEI				
h. m.	s.	°	'	"	1888					h. m.	s.	°	'	"	h. m.	s.	°	'	"
0 2 35.9		61	31	40.69	Mar. 7	E.	—	2.1		2 7 3.8		81	40	44.80	3 6 7.9		12	40	41.49
					8	S.	—	2.3											
					10	W.	—	0.7		1888					Jan. 10	W.	—	0.2	
					15	E.	—	2.1		Jan. 11	S.	—	2.0		Div., flex., etc.	+	1.27		
					Mean			1.36		14	S.	—	2.3						
					Div., flex., etc.	+		0.87		19	W.	—	0.8						
										20	S.	—	1.9						
										24	P.	—	1.4						
										Mean			1.68						
										Div., flex., etc.	+		2.31						

ζ PERSEI						ιι ORIONIS						α GEMINORUM						α ² GEMINORUM										
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
3	47	5.5	58	26	59.61	4	58	10.1	74	45	9.92	6	16	11.1	67	25	47.61	7	27	27.3	57	51	59.75					
1888						1888						1888						1888										
Jan.	10		W.		— 1.3	Mar.	19		E.		— 1.4	Feb.	8		E.		— 1.7	Jan.	11		S.		— 0.8					
Feb.	8		E.		— 1.4	Div., flex., etc.					+ 2.38	13		W.		— 1.1		19		W.		— 0.3						
Mar.	18		W.		— 1.6													Feb.	23		W.		— 0.1					
Mean					— 1.43	β ORIONIS						Mean					— 1.40	Mar.	15		E.		— 0.3					
Div., flex., etc.					+ 2.14	h.	m.	s.	°	'	"	Div., flex., etc.					+ 2.16	Mean					— 0.38					
γ ¹ ERIDANI						5	9	9.3	98	19	54.33	γ GEMINORUM						β GEMINORUM										
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
3	52	48.3	103	49	39.84	5	19	12.7	61	29	17.25	6	31	14.5	73	30	21.53	7	38	27.7	61	42	14.72					
1888						1888						1888						1888										
Jan.	28		W.		— 1.4	Jan.	10		W.		— 0.4	Feb.	13		W.		— 1.3	Jan.	19		W.		— 1.9					
Feb.	8		E.		— 0.8	Mar.	19		E.		— 3.0	Div., flex., etc.					+ 2.32	Feb.	23		W.		— 0.3					
Mar.	18		W.		— 2.1	Mean					— 1.70							Mean					— 1.10					
Mean					— 1.43	Div., flex., etc.					+ 2.22	α CANIS MAJORIS						Div., flex., etc.					+ 2.17					
Div., flex., etc.					+ 2.47	β TAURI						h.	m.	s.	°	'	"	φ GEMINORUM										
γ TAURI						h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.						m.	s.	°	'	"
h.	m.	s.	°	'	"	5	19	12.7	61	29	17.25	5	19	12.7	61	29	17.25	7	46	38.6	62	56	42.15					
4	13	25.2	74	38	36.84	1888						1888						1888										
Jan.	28		W.		— 3.1	Jan.	10		W.		— 1.0	Jan.	11		S.		— 0.9	Jan.	27		P.		— 1.2					
Feb.	8		E.		— 3.2	Feb.	24		P.		— 1.9	Div., flex., etc.					+ 2.45	Mar.	15		E.		— 2.2					
Mean					— 2.65	Feb.	2		S.		— 2.7	Mean					— 1.87	Mean					— 1.70					
Div., flex., etc.					+ 2.37	Div., flex., etc.					+ 2.17	Div., flex., etc.					+ 2.17	Div., flex., etc.					+ 2.14					
ε TAURI						δ ORIONIS						ε CANIS MAJORIS						15 ARGUS										
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
4	22	4.6	71	4	7.71	5	26	17.1	90	22	58.19	6	47	45.6	2	46	47.16	8	2	46.5	113	58	54.93					
1888						1888						1888						1888										
Jan.	28		W.		— 2.3	Jan.	11		S.		— 1.1	Jan.	19		W.		— 1.8	Jan.	27		P.		— 3.4					
Feb.	2		S.		— 2.3	Feb.	21		P.		— 2.2	Feb.	23		W.		— 0.4	28		W.		— 2.3						
Mean					— 2.30	Feb.	8		E.		— 2.5	Mean					— 1.40	Mar.	9		P.		— 2.1					
Div., flex., etc.					+ 2.22	Mean					— 1.93	Div., flex., etc.					+ 0.95	14		W.		— 1.1						
α TAURI						ε ORIONIS						δ CANIS MAJORIS						η CANCRI										
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
4	29	29.6	73	43	0.02	5	30	31.8	91	16	27.13	7	3	50.2	116	12	57.07	8	26	13.9	69	10	44.53					
1888						1888						1888						1888										
Jan.	24		P.		— 1.5	Jan.	11		S.		— 1.1	Jan.	19		W.		— 1.6	Jan.	28		W.		— 2.2					
Feb.	2		S.		— 1.0	Feb.	21		P.		— 2.2	Feb.	23		W.		— 0.9	Mar.	9		P.		— 1.1					
Mar.	18		W.		— 0.2	Feb.	8		E.		— 1.7	Mean					— 1.25	14		W.		— 1.4						
19			E.		— 1.8	Mean					— 2.05	Div., flex., etc.					+ 2.10	Mean					— 1.57					
Mean					— 1.12	Div., flex., etc.					+ 2.14	Mean					— 1.50	Div., flex., etc.					+ 2.19					
Div., flex., etc.					+ 2.33	α ORIONIS						δ ² GEMINORUM						ε ² HYDRÆ										
α CAMELOPARDALIS						h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
h.	m.	s.	°	'	"	5	49	6.5	82	36	52.78	7	13	26.0	67	48	44.30	8	40	50.7	83	10	15.12					
4	42	55.0	23	50	56.56	1888						1888						1888										
Jan.	2		S.		— 1.9	Jan.	11		S.		— 1.8	Jan.	19		W.		— 1.4	Jan.	28		W.		— 2.5					
Mar.	18		W.		— 0.9	Feb.	13		W.		— 1.6	Mar.	15		E.		— 1.2	Mar.	14		W.		— 1.7					
Mean					— 1.40	Mean					— 1.70	18		E.		— 2.8	15		E.		— 1.1							
Div., flex., etc.					+ 1.32	Div., flex., etc.					+ 2.31	Mean					— 1.80	18		E.		— 2.2						
ι AURIGÆ						ν ORIONIS						PIAZZI VII, 67						σ ² URSÆ MAJORIS										
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	h.	m.	s.	°	'	"					
4	49	42.0	57	0	43.82	6	1	10.7	75	13	8.58	7	19	13.4	21	18	24.99	9	0	31.8	22	24	41.69					
1888						1888						1888						1888										
Jan.	10		W.		0.0	Jan.	21		P.		— 1.8	Mar.	15		E.		— 0.9	Mar.	14		W.		— 0.6					
24			P.		— 2.2	Feb.	8		E.		— 2.8	Div., flex., etc.					+ 1.37	Div., flex., etc.					+ 1.35					
Feb.	2		S.		— 1.5	13			W.		— 0.5																	
Mar.	18		W.		— 1.8	Mean					— 1.70																	
19			E.		— 2.3	Div., flex., etc.					+ 2.39																	
Mean					— 1.56																							
Div., flex., etc.					+ 2.09																							

κ CANCRI					α SCORPII					β DRACONIS					ζ AQUILÆ				
h. m.	s.	°	'	"	h. m.	s.	°	'	"	h. m.	s.	°	'	"	h. m.	s.	°	'	"
9 1	40.9	78	52	53.54	16 22	32.4	116	10	57.62	17 27	54.2	37	36	55.99	19 0	15.8	76	18	8.90
1888					1888					1888					1888				
Jan. 28	W.	—		1.3	Jan. 10	S.	—		2.2	Jan. 13	S.	—		2.3	Jan. 20	P.	—		0.7
Mar. 15	E.	—		1.8	Div., flex., etc.	+			2.26	19	S.	—		2.5	23	P.	—		2.5
18	E.	—		2.5											27	W.	—		1.5
Mean		—		1.87	β HERCULIS					Mean		—		2.40	Mean		—		1.57
Div., flex., etc.		+		2.36	h. m.	s.	°	'	"	Div., flex., etc.		+		1.02	Div., flex., etc.		+		2.41
α HYDRÆ					16 25	24.3	68	15	56.89	α OPHIUCHI					λ URSÆ MINORIS, S. P.				
h. m.	s.	°	'	"	1888					h. m.	s.	°	'	"	h. m.	s.	°	'	"
9 22	5.0	98	10	24.90	Jan. 11	W.	—		0.3	17 29	44.1	77	21	28.31	19 35	44.2	358	57	44.44
1888					Div., flex., etc.	+			2.17	1888					1888				
Mar. 15	E.	—		3.4	ζ OPHIUCHI					Jan. 13	S.	—		2.8	Jan. 28	W.	—		2.1
18	E.	—		2.6	h. m.	s.	°	'	"	15	W.	—		2.3	Mar. 15	E.	—		1.0
Mean		—		3.00	16 30	59.5	100	20	22.38	18	W.	—		1.9	Mean		—		1.55
Div., flex., etc.		+		2.22	1888					19	S.	—		2.7	Div., flex., etc.		+		0.89
ϵ LEONIS					Jan. 10	S.	—		0.9	Mean		—		2.42	γ AQUILÆ				
h. m.	s.	°	'	"	13	S.	—		1.4	Div., flex., etc.		+		2.40	h. m.	s.	°	'	"
9 39	29.6	65	42	37.85	Mean		—		1.15	μ HERCULIS					19 40	56.1	79	19	32.99
1888					Div., flex., etc.		+		2.24	h. m.	s.	°	'	"	1888				
Mar. 15	E.	—		2.4	η HERCULIS					17 42	4.5	62	12	48.36	Jan. 27	W.	—		0.5
18	E.	—		2.5	h. m.	s.	°	'	"	15	W.	—		1.0	Div., flex., etc.		+		2.35
Mean		—		2.45	16 39	3.4	50	51	51.68	19	S.	—		1.2	α AQUILÆ				
Div., flex., etc.		+		2.14	1888					27	W.	—		1.7	h. m.	s.	°	'	"
τ LEONIS					Jan. 10	S.	—		1.1	Mean		—		1.30	19 45	19.1	81	25	37.13
h. m.	s.	°	'	"	11	W.	—		0.7	Div., flex., etc.		+		2.16	1888				
11 22	10.6	86	31	37.42	15	W.	—		1.4	γ DRACONIS					Jan. 27	W.	—		0.7
1888					Mean		—		1.07	h. m.	s.	°	'	"	Div., flex., etc.		+		2.31
Feb. 13	W.	—		1.8	Div., flex., etc.		+		1.58	17 54	0.3	38	29	51.93	γ CYGNI				
Div., flex., etc.		+		2.35	κ OPHIUCHI					1888					h. m.	s.	°	'	"
ν LEONIS					h. m.	s.	°	'	"	Jan. 15	W.	—		0.1	20 18	12.6	50	6	5.57
h. m.	s.	°	'	"	16 52	22.0	80	27	0.78	18	W.	—		0.7	1888				
11 31	12.9	90	12	19.87	1888					Mean		—		0.40	Jan. 11	S.	—		0.1
1888					Jan. 10	S.	—		0.3	Div., flex., etc.		+		0.96	14	S.	—		1.8
Feb. 13	W.	—		1.3	11	W.	—		0.5	δ URSÆ MINORIS, S. P.					Feb. 17	P.	—		1.3
Div., flex., etc.		+		2.13	13	S.	—		0.6	h. m.	s.	°	'	"	Mar. 7	S.	—		1.4
β^1 SCORPII					Mean		—		0.47	18 8	26.6	356	36	40.24	9	W.	—		1.7
h. m.	s.	°	'	"	Div., flex., etc.		+		2.32	1888					Mean		—		1.26
15 58	55.5	109	29	53.63	ϵ URSÆ MINORIS					Jan. 11	S.	—		0.5	Div., flex., etc.		+		1.47
1888					h. m.	s.	°	'	"	21	P.	+		0.2	α CYGNI				
Jan. 3	S.	—		1.5	16 57	28.3	7	46	47.04	Feb. 8	E.	—		1.4	h. m.	s.	°	'	"
Div., flex., etc.		+		2.40	1888					13	W.	—		0.2	20 37	36.8	45	7	10.85
δ OPHIUCHI					Jan. 11	W.	+		0.4	Mean		—		0.48	1888				
h. m.	s.	°	'	"	Div., flex., etc.		+		1.02	Div., flex., etc.		+		1.03	Jan. 12	W.	—		0.4
16 8	28.6	93	24	19.10	ϵ URSÆ MINORIS, S. P.					α LYRÆ					Feb. 17	P.	—		1.5
1888					h. m.	s.	°	'	"	h. m.	s.	°	'	"	Mar. 6	E.	—		2.2
Jan. 3	S.	—		1.3	16 57	28.3	352	13	12.96	18 33	8.8	51	19	12.97	7	S.	—		2.2
10	S.	—		1.7	1888					1888					9	W.	—		1.5
Mean		—		1.50	Jan. 10	W.	—		0.7	Jan. 13	S.	—		1.8	Mean		—		1.56
Div., flex., etc.		+		2.21	24	P.	+		0.4	18	W.	—		1.1	Div., flex., etc.		+		1.02
τ HERCULIS					Feb. 2	S.	—		0.3	Mean		—		0.8	ν CYGNI				
h. m.	s.	°	'	"	Mean		—		0.20	Div., flex., etc.		+		1.23	h. m.	s.	°	'	"
16 16	22.5	43	25	11.01	Div., flex., etc.		+		0.95	Mean		—		1.64	20 52	59.9	49	15	49.62
1888					α^1 HERCULIS					β LYRÆ					1888				
Jan. 10	S.	—		1.6	h. m.	s.	°	'	"	h. m.	s.	°	'	"	Jan. 14	S.	—		0.6
Div., flex., etc.		+		1.01	17 9	32.4	75	28	53.16	18 45	56.7	56	46	1.37	Mar. 6	E.	—		1.2
					1888					1888					14	E.	—		1.4
					Jan. 13	S.	—		2.0	Jan. 23	P.	—		2.4	Mean		—		1.07
					19	S.	—		2.3	Div., flex., etc.		+		2.09	Div., flex., etc.		+		1.39
					Mean		—		2.15										
					Div., flex., etc.		+		2.40										

ζ CYGNI						ι PEGASI						ε PEGASI—Continued.						α PISCIS AUSTRALIS					
h.	m.	s.	°	'	"	h.	m.	s.	°	'	"	1888						h.	m.	s.	°	'	"
21	8	10.1	60	13	56.08	21	16	54.4	70	40	27.78	5	W.	—	0.8			22	51	27.6	120	12	56.30
1888						1888						7	S.	—	0.9			1888					
Jan.	11		S.	—	1.7	Mar.	8		P.	—	2.5	14	E.	—	1.9			Jan.	19		W.	—	0.4
	14		S.	—	1.3	Div., flex., etc. + 2.21						Mean — 1.24							24		P.	—	2.4
Feb.	17		P.	—	1.6	β ² CEPHEI						Div., flex., etc. + 2.32						Mean — 1.40					
Mar.	6		E.	—	2.7	h. m. s. ° ' "						α AQUARI						Div., flex., etc. + 2.06					
	7		S.	—	1.2	21 27 12.7 19 55 51.43						h. m. s. ° ' "											
	8		P.	—	3.0	1888						22 0 1.9 90 51 49.26											
Mar.	9		W.	—	3.2	1888						1888											
	14		E.	—	2.2	21 27 12.7 19 55 51.43						Jan. 24 P. — 2.6											
Mean — 2.11						1888						Mar. 8 P. — 1.8											
Div., flex., etc. + 2.18						Mar. 7 S. — 0.8						Mean — 2.20											
α CEPHEI						Div., flex., etc. + 1.36						Div., flex., etc. + 2.13											
h. m. s. ° ' "						ε PEGASI						ζ PEGASI											
21 15 54.4 27 53 19.89						h. m. s. ° ' "						h. m. s. ° ' "											
1888						21 38 41.1 80 38 17.45						22 35 52.6 79 45 11.20											
Jan.	11		S.	—	0.5	1888						1888											
Mar.	14		E.	—	1.4	Jan. 11 S. — 1.5						Jan. 24 P. — 1.4											
Mean — 0.95						Mar. 2 E. — 1.1						Div., flex., etc. + 2.34											
Div., flex., etc. + 1.19																							

TRANSIT CIRCLE INDIVIDUAL MEAN PLACES

FOR 1888.0 OF
MISCELLANEOUS STARS

JANUARY 1 TO MARCH 19

1888

NOTE.—Numbers in () are catalogue magnitudes. Numbers in [] are the mean estimated magnitudes with screen.

WEISSE (2) 245									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (6.9)	2	12	43.60	50	40	52.5		
11	S. . .			43.54			51.9		
19	W. . .			43.57			52.1		
21	P. . .			43.58			50.6		
24	P. . .			43.62			52.9		
28	W. . .			43.62			51.2		
Means		2	12	43.59	50	40	51.87		
Div., flex., etc.							+ 1.56		
WEISSE (2) 314									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.8)	2	15	45.50	50	40	47.5		
11	S. [10.5]			45.24			46.5		
19	W. . .			45.38 ^s			48.5		
21	P. . .			45.22			46.5		
24	P. . .			45.25			48.6		
28	W. . .			45.29			46.7		
Means		2	15	45.30	50	40	47.38		
Div., flex., etc.							+ 1.56		
WEISSE (2) 360									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.5)	2	17	21.30	50	40	47.5		
11	S. . .			21.04			46.4		
19	W. . .			21.15			46.6		
21	P. . .			21.08			45.6		
24	P. . .			21.14			47.5		
28	W. . .			21.12			46.9		
Means		2	17	21.14	50	40	46.75		
Div., flex., etc.							+ 1.56		
BONN VI +38°, 502									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.6)	2	25	45.96	50	56	44.2		
19	W. . .			45.92			44.1		
21	P. . .			45.87			42.6		
24	P. . .			45.91			44.2		
28	W. . .			45.94			44.1		
Means		2	25	45.92	50	56	43.84		
Div., flex., etc.							+ 1.59		
WEISSE (2) 603									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.9)	2	27	18.63	50	57	11.9		
19	W. [11.0]			18.46 ^s			10.7		
21	P. . .			18.43			11.0		
24	P. . .			18.51			12.0		
28	W. . .			18.53			11.0		
Means		2	27	18.50	50	57	11.32		
Div., flex., etc.							+ 1.59		
WEISSE (2) 644									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.0)	2	28	49.35	50	56	32.3		
19	W. . .			49.23			33.0		
21	P. . .			49.24			31.2		
24	P. . .			49.22			32.6		
28	W. . .			49.39			32.1		
Means		2	28	49.29	50	56	32.24		
Div., flex., etc.							+ 1.59		
WEISSE (2) 1004									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.6)	2	43	17.54	59	56	16.4		
19	W. . .			17.67			16.9		
21	P. . .			17.64			16.6		
24	P. . .			17.57			17.5		
28	W. . .			17.59			15.1		
Means		2	43	17.60	59	56	16.50		
Div., flex., etc.							+ 2.18		
WEISSE (2) 1031									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.8)	2	44	23.94	59	57	14.5		
19	W. [10.5]			24.14 ^s			13.5		
21	P. . .			24.05			13.1		
24	P. . .			23.97			14.2		
28	W. . .			24.07			12.9		
Means		2	44	24.02	59	57	13.64		
Div., flex., etc.							+ 2.18		
WEISSE (2) 1047									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.5)	2	45	25.03	59	56	14.8		
19	W. . .			25.07			16.3		
21	P. . .			25.09			14.2		
24	P. . .			25.01			14.0		
28	W. . .			25.10			13.6		
Means		2	45	25.06	59	56	14.58		
Div., flex., etc.							+ 2.18		
WEISSE (2) 1255									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.8)	2	54	16.48	56	1	32.0		
11	S. [10.9]			16.55 ^s			33.2		
14	S. . .			16.74 ^s			32.6		
19	W. . .			16.55 ^s			33.2		
20	S. . .			16.60			32.5		
21	P. . .			16.45			31.0		
24	P. . .			16.47			32.6		
28	W. . .			16.46			33.3		
Means		2	54	16.51	56	1	32.55		
Div., flex., etc.							+ 2.08		
WEISSE (2) 1298									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.8)	2	56	13.26	55	59	42.0		
11	S. . .			13.31			40.8		
14	S. . .			13.32			40.2		
19	W. . .			13.34			41.8		
20	S. . .			13.32			40.6		
21	P. . .			13.22			41.0		
24	P. . .			13.23			41.9		
28	W. . .			13.35			40.1		
Means		2	56	13.29	55	59	41.05		
Div., flex., etc.							+ 2.08		
WEISSE (2) 1312									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.8)	2	56	55.74	55	59	6.0		
14	S. . .			55.82			4.9		
19	W. . .			55.90			4.9		
20	S. . .			55.82			4.7		
21	P. . .			55.73			5.1		
24	P. . .			55.80			5.3		
28	W. . .			55.76			5.2		
Means		2	56	55.80	55	59	5.16		
Div., flex., etc.							+ 2.08		
WEISSE (2) 373									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.4)	3	19	59.09	55	57	49.7		
11	S. . .			59.06			49.9		
19	W. . .			59.11			49.6		
21	P. . .			59.02			48.6		
24	P. . .			59.09			49.9		
28	W. . .			59.10			49.9		
Means		3	19	59.08	55	57	49.43		
Div., flex., etc.							+ 2.08		
D. M. +33°, 657									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (8.5)	3	21	19.90	56	1	20.2		
11	S. [10.5]			19.95			18.7		
19	W. . .			20.12 ^s			18.9		
21	P. . .			19.99			19.2		
24	P. . .			19.92			20.6		
28	W. . .			20.00			19.6		
Means		3	21	19.97	56	1	19.53		
Div., flex., etc.							+ 2.08		
WEISSE (2) 458									
1888	M	h	m	s	°	'	"		
Jan. 10	W. (7.6)	3	24	25.41	56	0	42.9		
11	S. . .			25.56			41.3		
19	W. . .			25.68			43.4		

WEISSE (2) 458—Continued.

1888	M	h	m	s	°	'	"
Jan. 21	P.	3	24	25.62	50	0	41.9
24	P.			25.63			43.0
28	W.			25.68			42.2
Means		3	24	25.60	56	0	42.45
Div., flex., etc.							+ 2.08

LALANDE 7488

1888	M	h	m	s	°	'	"
Jan. 10	W.	(7.9)	3	58	14.77	52	33
11	S.			14.77			2.0
14	S.			14.79			2.2
19	W.			14.88			2.0
21	P.			14.74			2.8
24	P.			14.88			3.6
28	W.			14.90			2.3
Feb. 8	E.			14.88			2.8
Means		3	58	14.83	52	33	2.53
Div., flex., etc.							+ 1.80

LALANDE 7603

1888	M	h	m	s	°	'	"
Jan. 10	W.	(6.5)	4	0	51.22	52	34
11	S.			51.21			0.6
14	S.			51.26			1.1
19	W.			51.30			1.6
21	P.			51.18			1.1
24	P.			51.27			2.4
28	W.			51.34			1.3
Feb. 8	E.			51.30			1.5
Means		4	0	51.26	52	34	1.55
Div., flex., etc.							+ 1.80

LALANDE 7734

1888	M	h	m	s	°	'	"
Jan. 10	W.	(8.5)	4	4	56.00	52	34
11	S.	[10.2]		55.96s			
14	S.			55.98s			53.5
19	W.			56.10s			54.4
21	P.			55.82			53.6
24	P.			55.87			55.7
28	W.			55.98			54.2
Feb. 8	E.			56.06s			53.1
Means		4	4	55.93	52	34	54.30
Div., flex., etc.							+ 1.80

WEISSE (2) 225

1888	M	h	m	s	°	'	"
Jan. 10	W.	(7.6)	5	11	3.53	49	1
11	S.			3.55			30.5
19	W.			3.62			31.4
21	P.			3.59			30.8
24	P.			3.64			30.8
28	W.			3.62			
Feb. 2	S.			3.70			30.2
8	E.			3.60			29.4
13	W.			3.56			31.1
Means		5	11	3.60	49	1	30.60
Div., flex., etc.							+ 1.36

WEISSE (2) 248

1888	M	h	m	s	°	'	"
Jan. 10	W.	(8.8)	5	11	38.68	49	4
11	S.	[10.8]		38.81			30.7
19	W.	11.		38.82s			31.2
21	P.			38.73			30.1
24	P.			38.84			30.8
28	W.			38.77			29.5
Feb. 2	S.			38.92s			30.6
8	E.			38.87s			29.5
13	W.			38.65			30.6
Means		5	11	38.75	49	4	30.53
Div., flex., etc.							+ 1.37

WEISSE (2) 267

1888	M	h	m	s	°	'	"
Jan. 10	W.	(6.2)	5	12	22.75	49	1
11	S.			22.75			47.5
28	W.			22.85			46.5
Feb. 13	W.			22.66			48.9
Means		5	12	22.75	49	1	47.75
Div., flex., etc.							+ 1.36

D. M. +40°, 1257

1888	M	h	m	s	°	'	"
Jan. 10	W.		5	13	19.01	49	4
Feb. 8	E.			19.17			4.5
13	W.			19.09			6.2
Means		5	13	19.09	49	4	5.40
Div., flex., etc.							+ 1.37

WEISSE (2) 342

1888	M	h	m	s	°	'	"
Jan. 11	S.	(6.5)	5	14	58.34	49	4
19	W.			58.44			55.9
21	P.			58.30			53.3
24	P.			58.38			54.4
28	W.			58.44			54.6
Feb. 2	S.			58.46			53.1
8	E.			58.49			53.8
13	W.			58.31			55.1
Means		5	14	58.40	49	4	54.26
Div., flex., etc.							+ 1.37

WEISSE 603

1888	M	h	m	s	°	'	"
Feb. 8	E.		5	26	17.18	90	22
Div., flex., etc.							+ 2.13

YARNALL 2790

1888	M	h	m	s	°	'	"
Jan. 11	S.		6	49	2.31	114	14
19	W.			2.39			51.4
Means		6	49	2.35	114	14	51.60
Div., flex., etc.							+ 2.31

ANONYMOUS

1888	M	h	m	s	°	'	"
Jan. 11	S.		6	49	2.36	114	14
19	W.	10.0		2.47			27.2
Means		6	49	2.42	114	14	27.60
Div., flex., etc.							+ 2.31

Σ (P. M.) 825

1888	M	h	m	s	°	'	"
Jan. 11	S.		7	5	17.62	67	32
19	W.			17.60			8.6
Means		7	5	17.61	67	32	7.55
Div., flex., etc.							+ 2.17

Σ 1035 minor

1888	M	h	m	s	°	'	"
Jan. 11	S.		7	5	18.09	67	31
19	W.			18.03			32
Means		7	5	18.06	67	32	0.55
Div., flex., etc.							+ 2.17

δ¹ GEMINORUM

1888	M	h	m	s	°	'	"
Mar. 15	E.	8.8	7	13	25.93	67	48
18	E.			25.80			48.2
Means		7	13	25.86	67	48	48.70
Div., flex., etc.							+ 2.17

α¹ GEMINORUM

1888	M	h	m	s	°	'	"
Mar. 15	E.		7	27	26.82	57	52
Div., flex., etc.							+ 2.12

D. M. +24°, 1784

1888	M	h	m	s	°	'	"
Jan. 19	W.	9.5	7	43	41.03	65	58
28	W.	9.5		41.22			0.6
Feb. 13	W.	9.5		41.31			1.3
Means		7	43	41.19	65	58	1.20
Div., flex., etc.							+ 2.14

ANONYMOUS

1888	M	h	m	s	°	'	"
Jan. 19	W.	10.0	7	43	44.86	65	57
28	W.			44.62			54.2
Feb. 13	W.	10.0		44.74			55.6
Means		7	43	44.74	65	57	55.40
Div., flex., etc.							+ 2.14

ANONYMOUS

1888	M	h	m	s	°	'	"
Jan. 19	W.	9.0	7	43	52.05	65	59
28	W.			51.79			58.7
Feb. 13	W.	9.5		52.04			58.3
Means		7	43	51.96	65	58	59.03
Div., flex., etc.							+ 2.14

LALANDE (F) 1186

1888	M	h	m	s	°	'	"
Jan. 19	W.		7	46	46.37	15	47
28	W.			46.69			3.8
Feb. 13	W.			46.62			4.5
Means		7	46	46.56	15	47	4.03
Div., flex., etc.							+ 1.38

LALANDE (F) 1192

1888	M	h	m	s	°	'	"
Mar. 15	E.		8	2	47.36	7	13
Div., flex., etc.							+ 1.01

ANONYMOUS

1888	M	h	m	s	°	'	"
Mar. 15	E.	11.5	8	29	32.25	68	16
18	E.	11.5		32.37			15
Means		8	29	32.31	68	15	59.80
Div., flex., etc.							+ 2.17

ε¹ HYDRÆ

1888	M	h	m	s	°	'	"
Mar. 15	E.		8	40	30.21	83	10
Div., flex., etc.							+ 2.32

ANONYMOUS

1888	M	h	m	s	°	'	"
Mar. 15	E.	11.0	9	46	19.51	74	0
18	E.	11.3		19.62			4.9
Means		9	46	19.56	74	0	5.60
Div., flex., etc.							+ 2.34

ANONYMOUS

1888	M	h	m	s	°	'	"
Feb. 13	W.	10.0	12	1	1.61	89	53
Div., flex., etc.							+ 2.14

TRANSIT CIRCLE INDIVIDUAL MEAN PLACES

FOR 1888.0 OF
MISCELLANEOUS STARS

JUNE 17 TO DECEMBER 31

1888

WEISSE (2) 20									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	1	4	14.88	65	8	8.1		
28 E.	. .			14.81			9.5		
Means		1	4	14.84	65	8	8.80		
Div. and flex.							+ 0.23		
B. A. C. 363									
1888	M	h	m	s	°	'	"		
Dec. 28 E.	. .	1	8	9.84	18	50	59.1		
Div. and flex.							— 0.44		
B. A. C. 588									
1888	M	h	m	s	°	'	"		
Dec. 22 S.	. .	1	51	22.75	25	55	27.1		
Div. and flex.							— 0.39		
WEISSE 925									
1888	M	h	m	s	°	'	"		
Dec. 6 E.	. .	1	53	57.93	96	55	35.3		
13 W.	9.0			57.69			34.8		
14 E.	. .			57.95			33.9		
Means		1	53	57.86	96	55	34.67		
Div. and flex.							+ 0.26		
WEISSE 1077									
1888	M	h	m	s	°	'	"		
Dec. 6 E.	. .	2	1	54.90	96	53	52.7		
13 W.	9.0			54.70			51.6		
14 E.	. .			54.87			51.7		
Means		2	1	54.82	96	53	52.00		
Div. and flex.							+ 0.26		
B. A. C. 653									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	2	2	37.09	36	41	13.5		
21 W.	. .			37.04			13.2		
Means		2	2	37.06	36	41	13.35		
Div. and flex.							— 0.20		
LALANDE 4271									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	2	12	38.42	67	20	57.8		
21 W.	. .			38.54			56.3		
Means		2	12	38.48	67	20	57.05		
Div. and flex.							+ 0.09		
LALANDE 4572									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	2	22	50.48	67	1	54.2		
21 W.	. .			50.66			53.9		
Means		2	22	50.57	67	1	54.05		
Div. and flex.							+ 0.11		
WEISSE 397									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	8.0	2	25	33.31	88	13	39.3		
21 W.	. .			33.41			. .		
Means		2	25	33.36	88	13	39.30		
Div. and flex.							— 0.21		
B. A. C. 776									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	2	25	42.43	88	13	46.6		
21 W.	. .			42.61			46.8		
Means		2	26	42.52	88	13	46.70		
Div. and flex.							— 0.21		
B. A. C. 784									
1888	M	h	m	s	°	'	"		
Dec. 22 S.	. .	2	31	42.74	9	1	40.4		
Div. and flex.							— 0.20		
LALANDE 5221									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	2	44	11.94	43	37	15.5		
21 W.	. .			11.93			15.0		
22 S.	. .			11.89			17.4		
Means		2	44	11.92	43	37	15.97		
Div. and flex.							— 0.22		
LALANDE 5579									
1888	M	h	m	s	°	'	"		
Dec. 29 W.	. .	2	58.0		26	22	42.7		
Div. and flex.							— 0.40		
WEISSE (2) 136									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	3	8	31.16	59	51	39.4		
Div. and flex.							+ 0.13		
WEISSE (2) 320									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	3	17	29.53	56	51	44.5		
29 W.	. .			29.49			43.4		
Means		3	17	29.51	56	51	43.95		
Div. and flex.							+ 0.05		
LALANDE 6345									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	3	21	18.63	56	34	53.8		
Div. and flex.							+ 0.02		
GROOMBRIDGE 703									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	3	26	12.06	50	28	45.7		
Div. and flex.							— 0.08		
B. A. C. 1133									
1888	M	h	m	s	°	'	"		
Dec. 20 E.	. .	3	36	15.16	27	0	36.8		
Div. and flex.							— 0.44		
LALANDE 6820									
1888	M	h	m	s	°	'	"		
Dec. 21 W.	. .	3	37	16.51	53	53	39.7		
Div. and flex.							— 0.02		
WEISSE (2) 1023									
1888	M	h	m	s	°	'	"		
Dec. 28 E.	. .	3	49	13.66	53	10	15.9		
Div. and flex.							— 0.05		

WEISSE (2) 1064							
1888	M	h	m	s	°	'	"
Dec. 28 E.	. .	3	51	17.01	53	11	27.8
Div. and flex.					—	0.05	
D. M. + 36°, 804							
1888	M	h	m	s	°	'	"
Dec. 28 E.	. .	3	53	51.43	53	11	27.4
Div. and flex.					—	0.05	
LALANDE 7419							
1888	M	h	m	s	°	'	"
Dec. 28 E.	. .	3	55	47.95	53	11	33.1
Div. and flex.					—	0.05	
LALANDE 7466							
1888	M	h	m	s	°	'	"
Dec. 28 E.	. .	3	57	35.80	53	13	10.8
Div. and flex.					—	0.05	

WEISSE (2) 1248							
1888	M	h	m	s	°	'	"
Dec. 28 E.	. .	4	0	24.15	53	12	9.9
Div. and flex.					—	0.05	
D. M. — 0°, 706							
1888	M	h	m	s	°	'	"
Nov. 12 W.	. .	4	22	14.17	90	52	53.8
Div. and flex.					—	0.15	
B. A. C. 1846							
1888	M	h	m	s	°	'	"
Dec. 29 W.	. .	5	43	15.47	77	23	11.1
Div. and flex.					—	0.06	
WEISSE 256							
1888	M	h	m	s	°	'	"
Oct. 17 W.	8.5	6	11	10.40	83	52	42.9
Div. and flex.					—	0.17	

LALANDE 12048							
1888	M	h	m	s	°	'	"
Oct. 17 W.	8.0	6	13	4.22	83	51.6	
WEISSE 1437							
1888	M	h	m	s	°	'	"
Oct. 17 W.	. .	6	49	2.33	80	12	34.0
Div. and flex.					—	0.12	
BONN VI + 10°, 1335							
1888	M	h	m	s	°	'	"
Oct. 17 W.	. .	6	50	15.98	79	53	58.9
Div. and flex.					—	0.12	

TRANSIT-CIRCLE CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED FROM

JANUARY 1 TO MARCH 19

1888

[NOTE.—The Right Ascensions of the faint stars have been corrected, in this catalogue, for Special Personal Equation. See Introduction to Transit Circle.]

NUMBER	NAME OF STAR	MAGNITUDE	RIGHT ASCENSION 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.	NORTH POLAR DIST. 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.
			h m s	s			° ' "	"		
1	Weisse (2) 245	. .	2 12 43.59	+ 3.672	8.1	6	50 40 53.4	— 16.78	8.1	6
2	Weisse (2) 314	. .	15 45.30	3.684	8.1	6	50 40 48.9	16.64	8.1	6
3	Weisse (2) 360	. .	17 21.14	3.690	8.1	6	50 40 48.3	16.56	8.1	6
4	Bonn VI + 38°, 502 . .	. .	25 45.92	3.717	8.1	5	50 56 45.4	16.13	8.1	5
5	Weisse (2) 603	. .	27 18.50	3.722	8.1	5	50 57 12.9	16.05	8.1	5
6	Weisse (2) 644	. .	28 49.29	+ 3.728	8.1	5	50 56 33.8	— 15.97	8.1	5
7	Weisse (2) 1004	. .	43 17.60	3.578	8.1	5	59 56 18.7	15.17	8.1	5
8	Weisse (2) 1031	. .	44 24.02	3.581	8.1	5	59 57 15.8	15.11	8.1	5
9	Weisse (2) 1047	. .	45 25.06	3.584	8.1	5	59 56 16.8	15.05	8.1	5
10	Weisse (2) 1255	. .	54 16.51	3.693	8.1	8	56 1 34.6	14.53	8.1	8
11	Weisse (2) 1298	. .	56 13.29	+ 3.700	8.1	8	55 59 43.1	— 14.41	8.1	8
12	Weisse (2) 1312	. .	2 56 55.80	3.702	8.1	7	55 59 7.2	14.37	8.1	7
13	Weisse (2) 373	. .	3 19 59.08	3.764	8.1	6	55 57 51.5	12.89	8.1	6
14	D. M. + 33°, 657 . . .	. .	21 19.97	3.766	8.1	6	56 1 21.6	12.80	8.1	6
15	Weisse (2) 458	. .	24 25.60	3.774	8.1	6	56 0 44.5	12.59	8.1	6
16	Lalande 7488	. .	3 58 14.83	+ 3.955	8.1	8	52 33 4.3	— 10.16	8.1	7
17	Lalande 7603	. .	4 0 51.26	3.961	8.1	8	52 34 3.4	9.96	8.1	8
18	Lalande 7734	. .	4 4 55.93	3.969	8.1	8	52 34 56.1	9.65	8.1	7
19	Weisse (2) 225	. .	5 11 3.60	4.207	8.1	9	49 1 32.0	4.25	8.1	7
20	Weisse (2) 248	. .	11 38.75	4.206	8.1	9	49 4 31.9	4.20	8.1	9
21	Weisse (2) 267	. .	12 22.75	+ 4.208	8.1	4	49 1 49.1	— 4.14	8.1	4
22	D. M. + 40°, 1257 . .	. .	13 19.09	4.208	8.1	3	49 4 6.8	4.06	8.1	3
23	Weisse (2) 342	. .	14 58.40	4.209	8.1	8	49 4 55.6	3.92	8.1	8
24	Weisse 603	. .	5 26 17.18	3.064	8.1	1	90 22 5.0	— 2.94	8.1	1
25	Yarnall 2790	. .	6 49 2.35	2.484	8.0	2	114 14 53.9	+ 4.26	8.0	2

NUMBER	NAME OF STAR	MAGNITUDE	RIGHT ASCENSION 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.	NORTH POLAR DIST. 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.
			h m s	s			° ' "	"		
26	Anonymous	10.0	6 49 2.42	+ 2.484	8.0	2	114 14 29.9	+ 4 26	8.0	2
27	Σ (P. M.) 825	. .	7 5 17.61	3.603	8.0	2	67 32 9.7	5.64	8.0	2
28	Σ 1035 <i>minor</i>	. .	5 18.06	3.603	8.0	2	67 32 2.7	5.64	8.0	2
29	δ^1 Geminorum	8.8	13 25.86	3.590	8.2	2	67 48 50.9	6.32	8.2	2
30	α^1 Geminorum	. .	27 26.82	3.852	8.2	1	57 52 5.0	7.47	8.2	1
31	D. M. + 24°, 1784	9.5	43 41.19	+ 3.609	8.1	3	65 58 3.3	+ 8.77	8.1	3
32	Anonymous	10.0	43 44.67	3.609	8.1	3	65 57 57.5	8.77	8.1	3
33	Anonymous	9.2	43 51.96	3.608	8.1	3	65 59 1.2	8.78	8.1	3
34	Lalande (F) 1186	. .	7 46 46.56	7.298	8.1	3	15 47 5.4	9.01	8.1	3
35	Lalande (F) 1192	. .	8 2 47.36	12.140	8.2	1	7 13 30.6	10.24	8.2	1
36	Anonymous	11.5	29 31.99	+ 3.496	8.2	2	68 16 2.0	+ 12.18	8.2	2
37	ϵ^1 Hydræ	. .	8 40 30.21	3.195	8.2	1	83 10 17.8	12.92	8.2	1
38	Anonymous	11.2	9 46 19.32	3.284	8.2	2	74 0 7.9	16.74	8.2	2
39	Anonymous	10.0	12 1 1.54	+ 3.072	8.1	1	89 53 15.8	+ 20.05	8.1	1

TRANSIT-CIRCLE CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED FROM

JUNE 17 TO DECEMBER 31

1888

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NUMBER	NAME OF STAR	MAGNITUDE	RIGHT ASCENSION 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.	NORTH POLAR DIST. 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.
			h m s	s			° ' "	"		
1	Weisse (2) 20	. .	1 4 14.84	+ 3.244	9.0	2	65 8 9.0	— 19.27	9.0	2
2	B. A. C. 363	. .	8 9.84	4.220	9.0	1	18 50 58.7	19.17	9.0	1
3	B. A. C. 588	. .	51 22.75	4.357	9.0	1	25 55 26.7	17.73	9.0	1
4	Weisse 925	9.0	1 53 57.81	2.995	8.9	3	96 55 34.9	17.62	8.9	3
5	Weisse 1077	9.0	2 1 54.78	2.990	8.9	3	96 53 52.3	17.28	8.9	3
6	B. A. C. 653	. .	2 37.06	+ 3.987	9.0	2	36 41 13.2	— 17.25	9.0	2
7	Lalande 4271	. .	12 38.48	3.378	9.0	2	67 20 57.2	16.79	9.0	2
8	Lalande 4572	. .	22 50.57	3.403	9.0	2	67 1 54.2	16.28	9.0	2
9	Weisse 397	8.0	25 33.36	3.097	9.0	2	88 13 39.1	16.14	9.0	1
10	B. A. C. 776	. .	25 42.52	3.097	9.0	2	88 13 46.5	16.13	9.0	2
11	B. A. C. 784	. .	31 42.74	+ 8.245	9.0	1	9 1 40.2	— 15.82	9.0	1
12	Lalande 5221	. .	44 11.92	3.994	9.0	3	43 37 15.8	15.12	9.0	3
13	Lalande 5579	. .	2 58.0	. . .	. .	. .	26 22 42.3	14.31	9.0	1
14	Weisse (2) 136	. .	3 8 31.16	3.641	9.0	1	59 51 39.5	13.64	9.0	1
15	Weisse (2) 320	. .	17 29.51	3.735	9.0	2	56 51 44.0	13.06	9.0	2
16	Lalande 6345	. .	21 18.63	+ 3.752	9.0	1	56 34 53.8	— 12.80	9.0	1
17	Groombridge 703	. .	26 12.06	3.936	9.0	1	50 28 45.6	12.47	9.0	1
18	B. A. C. 1133	. .	36 15.16	5.196	9.0	1	27 0 36.4	11.77	9.0	1
19	Lalande 6820	. .	37 16.51	3.864	9.0	1	53 53 39.7	11.70	9.0	1
20	Weisse (2) 1023	. .	49 13.66	3.915	9.0	1	53 10 15.8	10.83	9.0	1
21	Weisse (2) 1064	. .	51 17.01	+ 3.919	9.0	1	53 11 27.8	— 10.68	9.0	1
22	D. M. + 36°, 804	. .	53 51.43	3.925	9.0	1	53 11 27.4	10.49	9.0	1
23	Lalande 7419	. .	55 47.95	3.930	9.0	1	53 11 33.0	10.34	9.0	1
24	Lalande 7466	. .	3 57 35.80	3.933	9.0	1	53 13 10.8	10.21	9.0	1
25	Weisse (2) 1248	. .	4 0 24.15	3.939	9.0	1	53 12 9.8	10.00	9.0	1

NUMBER	NAME OF STAR	MAGNITUDE	RIGHT ASCENSION 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.	NORTH POLAR DIST. 1888.0	ANNUAL PRECESSION 1888.0	MEAN YEAR	NO. OF OBS.
			h m s	s			° ' "	"		
26	D. M. — 0°, 706 . . .	. .	4 22 14.17	+ 3.054	8.9	1	90 52 53.6	— 8.30	8.9	1
27	B. A. C. 1846	. .	5 43 15.47	3.371	9.0	1	77 23 11.0	— 1.46	9.0	1
28	Weisse 256	8.5	6 11 10.40	3.216	8.8	1	83 52 42.7	+ 0.98	8.8	1
29	Lalande 12048	8.0	13 4.22	3.216	8.9	1	83 51.6	. .	. .	.
30	Weisse 1437	. .	49 2.33	3.298	8.9	1	80 12 33.9	4.26	8.9	1
31	Bonn VI + 10°, 1335 .	. .	50 15.98	+ 3.305	8.9	1	79 53 58.8	+ 4.36	8.9	1

TRANSIT CIRCLE

SUN, MOON AND PLANETS

POSITIONS AND SEMIDIAMETERS OF THE

WITH CORRECTIONS TO THEIR EPHEMERIDES

JANUARY 1 TO MARCH 19

1888

SUN

DATE	OBS'R	LIMB	APPARENT RIGHT ASCENSION OF CENTER	CORR'N TO <i>Am. Eph.</i>	SID. TIME OF TRANSIT OF SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>	LIMB	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO <i>Am. Eph.</i>	VERTICAL SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>
1888			h m s	s	m s	s		° ' "	"	' "	"
Jan. 11	S.	I	19 30 45.54	— 0.01	. . .	. . .	S	III 48 49.8	+ 2.3	. . .	. . .
12	W.	.	19 35 5.64	— 0.05	I 10.20	— 0.18	.	III 39 11.1	— 0.4	16 17.7	— 0.4
14	S.	.	19 43 44.09	— 0.01	I 10.16	— 0.04	.	III 18 43.7	— 0.5	16 16.6	— 1.4
16	W.	II	19 52 19.87	+ 0.02	. . .	. . .	S	II 56 39.1	+ 1.3	. . .	. . .
19	W.	.	20 5 7.96	— 0.17	I 9.68	— 0.04	.	II 20 33.1	+ 2.0	16 16.7	— 0.9
Jan. 21	P.	.	20 13 36.30	— 0.21	I 9.40	— 0.11	.	IO 9 54 30.9	— 0.1	16 14.6	— 2.8
24	P.	.	20 26 13.02	— 0.12	I 9.04	— 0.15	.	IO 9 12 45.2	0.0	16 12.9	— 4.2
28	W.	.	20 42 50.68	+ 0.05	I 8.58	— 0.17	.	IO 8 12 12.1	+ 2.0	16 15.3	— 1.3
Feb. 18	P.	.	22 6 37.66	+ 0.02	I 6.26	— 0.14	.	IO 1 38 17.2	+ 0.6	16 10.6	— 2.3
Mar. 3	E.	.	22 59 35.04	— 0.02	I 5.20	— 0.03	.	96 26 58.1	+ 0.8	16 9.5	— 0.2
6	W.	.	23 10 42.82	0.00	I 4.96	— 0.08	.	95 17 21.7	+ 1.0	16 7.4	— 1.5
7	E.	.	23 14 24.84	+ 0.22	I 4.88	— 0.11	.	94 53 58.6	— 0.8	16 6.9	— 1.7
8	S.	.	23 18 6.10	+ 0.04	I 4.84	— 0.09	.	94 30 35.9	+ 1.6	16 6.3	— 2.1
Mar. 9	P.	.	23 21 47.16	0.00	I 4.76	— 0.12	.	94 7 6.4	+ 0.6	16 5.8	— 2.3
10	W.	.	23 25 28.07	+ 0.14	I 4.68	— 0.15	.	93 43 34.5	+ 0.4	16 6.8	— 1.0
15	E.	.	23 43 47.45	— 0.01	I 4.56	— 0.07	.	91 45 22.8	+ 0.6	16 5.8	— 0.7
19	E.	.	23 58 22.88	— 0.02	I 4.51	— 0.03	.	90 10 31.9	— 0.7	16 5.3	— 0.1

MOON

DATE	MEAN TIME OF TRANSIT OF CENTER	OBSERVER	LIMB	APPARENT RIGHT ASCENSION OF CENTER	CORR'N TO <i>Am. Eph.</i>	LIMB	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO <i>Am. Eph.</i>
1888	h m			h m s	s		° ' "	"
Jan. 19	5 9.68	W.	I	I 4 39.98	+ 0.02	S	88 19 45.8	— 0.7
20	5 51.51	S.	I	I 50 32.63	+ 0.02	S	84 8 41.2	— 2.3
21	6 33.98	P.	I	2 37 5.05	+ 0.23	S	80 11 50.2	— 2.0
24	8 52.49	P.	I	5 7 48.09	+ 0.31	.	. . .	. . .
Jan. 27	11 31.83	P.	I	7 59 24.18	+ 0.11	N	70 28 42.4	+ 1.2
28	12 26.98	W.	I II	8 58 38.39	+ 0.04	S N	72 37 0.3	0.0
Feb. 18	5 11.51	P.	I	3 4 46.41	+ 0.16	S	78 1 48.6	— 2.0
23	9 16.96	W.	I	7 30 36.17	+ 0.15	N	69 51 17.8	+ 1.2
Mar. 6	20 12.84	W.	II	19 15 35.73	— 0.09	.	. . .	. . .
7	21 6.36	S.	II	20 13 11.92	— 0.26	.	. . .	. . .
15	2 24.51	E.	I	I 59 49.29	+ 0.08	.	. . .	. . .
18	4 36.24	W.	I	4 23 44.92	+ 0.25	S	72 56 37.3	— 1.5
19	5 23.61	E.	I	5 15 10.99	+ 0.13	S	70 49 6.1	— 1.0

MERCURY											
DATE	OBS'R	PART OBS'D	APPARENT RIGHT ASCENSION OF CENTER	CORR'N TO <i>Am. Eph.</i>	SID. TIME OF TRANSIT OF SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>	PART OBS'D	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO <i>Am. Eph.</i>	VERTICAL SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>
1888			h m s	s	s	s		° ' "	"	"	"
Jan. 13	S.	C	19 33 50.47	+ 0.48	. .	. .	C	113 36 38.0	+ 0.9	. .	. .
28	W.	C	21 13 20.59	+ 0.21	. .	. .	C	108 6 53.0	+ 1.2	. .	. .
Feb. 18	P.	I	23 11 30.45	+ 0.13	. .	. .	C	93 31 39.5	+ 2.0	. .	. .
VENUS											
1888			h m s	s	s	s		° ' "	"	"	"
Jan. 3	S.	II	15 52 12.14	+ 0.02	. .	. .	S	107 31 2.6	+ 1.1	. .	. .
10	S.	.	16 25 50.63	+ 0.06	0.62	0.00	S	109 13 24.8	+ 1.7	. .	. .
11	W.	II	16 30 44.31	+ 0.17	. .	. .	.	109 26 23.2	+ 3.2	9.3	+ 0.6
13	S.	.	16 40 34.93	+ 0.02	0.64	+ 0.03	S	109 50 53.3	+ 2.1	. .	. .
15	W.	II	16 50 30.52	+ 0.20	. .	. .	.	110 13 28.6	+ 1.3	9.4	+ 1.0
Jan. 19	S.	.	17 10 34.02	+ 0.10	0.61	+ 0.02	S	110 52 33.6	+ 0.6	. .	. .
27	W.	II	17 51 24.18	+ 0.21	. .	. .	.	. . .	. .	. .	. .
Feb. 17	P.	II	19 40 26.84	+ 0.18	. .	. .	C	110 53 40.1	- 0.3	. .	. .
Mar. 2	E.	II	20 51 39.36	+ 0.09	. .	. .	N	107 50 48.7	+ 0.4	. .	. .
6	E.	II	21 11 30.47	+ 0.23	. .	. .	.	. . .	. .	. .	. .
Mar. 7	S.	.	21 16 25.66	+ 0.02	0.49	+ 0.05	.	106 20 5.7	+ 0.7	7.0	+ 0.6
8	P.	II	21 21 20.30	+ 0.22	. .	. .	C	106 0 30.9	+ 0.1	. .	. .
9	W.	II	21 26 13.79	+ 0.23	. .	. .	.	105 40 30.5	+ 1.0	8.1	+ 1.8
14	E.	II	21 50 26.68	+ 0.20	. .	. .	N	103 54 0.5	+ 0.3	. .	. .
SATURN											
1888			h m s	s	s	s		° ' "	"	"	"
Jan. 28	W.	.	8 20 6.55	- 0.90	0.71	- 0.02	.	69 54 57.3	- 2.5	9.4	- 0.2
Feb. 13	W.	.	8 15 0.05	- 0.90	0.73	0.00	.	69 36 54.9	- 1.8	9.4	- 0.2
Mar. 9	P.	.	8 9 12.38	- 0.78	0.64	- 0.07	C	69 17 12.2	- 0.3	. .	. .
Mar. 14	W.	.	8 8 30.75	- 0.93	0.68	- 0.02	.	69 14 50.1	- 1.3	9.6	+ 0.4
15	E.	.	8 8 23.76	- 0.92	0.70	0.00	.	69 14 26.1	- 1.2	9.1	- 0.1
18	E.	.	8 8 5.34	- 0.99	0.74	+ 0.04	.	69 13 22.2	- 1.3	6.6	- 2.5
NEPTUNE											
1888			h m s	s	s	s		° ' "	"	"	"
Jan. 10	W.	.	3 42 24.32	+ 0.25	. .	. .	.	72 4 30.3	+ 0.9	. .	. .
19	W.	.	3 41 56.66	+ 0.31	. .	. .	.	72 5 29.1	- 1.2	. .	. .
20	S.	.	3 41 54.15	+ 0.23	. .	. .	.	72 5 34.5	- 0.3	. .	. .
21	P.	.	3 41 51.80	+ 0.19	. .	. .	.	72 5 38.1	- 0.7	. .	. .
24	P.	.	3 41 45.76	+ 0.26	. .	. .	.	72 5 49.5	+ 1.3	. .	. .

TRANSIT CIRCLE

POSITIONS AND SEMIDIAMETERS OF THE

SUN, MOON AND PLANETS

WITH CORRECTIONS TO THEIR EPHEMERIDES

JUNE 17 TO DECEMBER 31

1888

SUN																	
DATE	OBS'R	LIMB	APPARENT RIGHT ASCENSION OF CENTER			CORR'N TO <i>Am. Eph.</i>	SID. TIME OF TRANSIT OF SEMIDIAM.		CORR'N TO <i>Am. Eph.</i>	LIMB	GEOCENTRIC N. P. DISTANCE OF CENTER			CORR'N TO <i>Am. Eph.</i>	VERTICAL SEMIDIAM.		CORR'N TO <i>Am. Eph.</i>
1888			h	m	s	s	m	s	s		°	'	"	"	'	"	"
June 18	E.	.	5	50	27.28	— 0.04	1	8.94	— 0.03	.	66	33	58.5	+ 1.5	15	44.9	— 1.7
July 25	E.	.	8	21	36.39	— 0.05	1	7.08	— 0.09	.	70	31	35.5	+ 2.5	15	45.7	— 1.6
26	P.	.	8	25	32.73	— 0.05	1	6.96	— 0.13	.	70	44	56.7	+ 1.1	15	44.8	— 2.6
Aug. 2	W.	.	8	52	50.71	— 0.02	1	6.42	— 0.06	.	72	27	15.2	+ 1.1	15	46.9	— 1.3
7	P.	.	9	12	2.95	— 0.09	1	5.93	— 0.11	.	73	48	59.7	+ 0.4	15	47.0	— 1.9
Aug. 8	W.	.	9	15	51.81	+ 0.06	1	5.86	— 0.10	.	74	6	11.5	+ 3.1	15	47.6	— 1.5
9	E.	.	9	19	39.73	— 0.14	1	5.93	+ 0.06	.	74	23	35.7	+ 2.8	15	47.7	— 1.6
10	P.	.	9	23	27.36	— 0.04	1	5.60	— 0.19	.	74	41	12.6	+ 0.1	15	48.3	— 1.1
14	W.	.	9	38	31.80	+ 0.02	1	5.42	— 0.05	.	75	54	13.4	— 0.8	15	48.8	— 1.3
15	S.	.	9	42	16.65	+ 0.17	1	5.40	0.00	.	76	13	3.8	— 0.1	15	48.6	— 1.7
Aug. 16	W.	.	9	46	0.66	+ 0.01	1	5.18	— 0.15	.	76	32	9.1	+ 2.4	15	50.4	— 0.1
24	S.	.	10	15	36.10	— 0.04	1	4.72	— 0.07	.	79	11	42.8	+ 0.7	15	50.3	— 1.8
25	E.	.	10	19	16.01	— 0.09	1	4.78	+ 0.05	.	79	32	29.3	+ 0.7	15	51.0	— 1.3
28	S.	.	10	30	13.74	— 0.01	1	4.52	— 0.04	.	80	35	47.7	+ 0.9	15	50.7	— 2.3
30	S.	.	10	37	30.55	+ 0.04	1	4.35	— 0.11	.	81	18	47.9	+ 3.0	15	51.9	— 1.5
Sept. 12	S.	.	11	24	25.59	— 0.06	1	4.06	— 0.02	.	86	9	47.5	+ 0.8	15	55.3	— 1.3
13	P.	.	11	28	1.04	— 0.03	1	3.94	— 0.13	.	86	32	48.4	+ 0.6	15	55.2	— 1.6
14	W.	.	11	31	36.41	+ 0.01	1	4.00	— 0.06	.	86	55	54.2	+ 1.6	15	56.6	— 0.5
20	W.	.	11	53	7.96	— 0.07	1	3.96	— 0.12	.	89	15	21.8	+ 1.6	15	57.3	— 1.4
21	S.	.	11	56	43.46	0.00	1	4.00	— 0.09	.	89	38	41.6	— 0.1	15	57.8	— 1.2
Sept. 26	W.	.	12	14	42.68	0.00	1	4.10	— 0.11	.	91	35	40.7	+ 1.8	16	0.0	— 0.3
Oct. 10	S.	.	13	5	41.73	+ 0.08	1	4.95	+ 0.03	.	96	59	36.7	+ 2.5	16	2.9	— 1.3
17	W.	.	13	31	42.96	+ 0.02	1	5.38	— 0.11	.	99	35	38.8	+ 2.6	16	5.1	— 1.1
29	S.	.	14	17	31.68	— 0.04	1	6.70	— 0.01	.	103	45	56.8	+ 1.0	16	8.2	— 1.1
31	E.	.	14	25	20.40	+ 0.01	1	6.95	+ 0.02	.	104	24	56.4	+ 1.0	16	8.8	— 1.0
Nov. 6	W.	.	14	49	6.20	+ 0.12	1	7.53	— 0.11	.	106	16	8.0	0.0	16	11.0	— 0.2
20	W.	.	15	46	29.37	+ 0.35	1	9.20	— 0.08	.	109	54	49.5	— 0.5	16	14.8	+ 0.5
22	E.	.	15	54	54.03	— 0.04	1	9.48	— 0.02	.	110	20	42.1	+ 3.1	16	16.6	+ 1.9
30	S.	.	16	29	4.96	— 0.14	1	10.16	— 0.13	.	111	48	29.0	— 0.2	16	14.9	— 1.1
Dec. 5	E.	.	16	50	49.03	+ 0.01	1	10.68	0.00	.	112	29	59.4	— 0.2	16	16.4	— 0.3
Dec. 7	W.	.	16	59	34.49	+ 0.08	1	10.72	— 0.10	.	112	43	34.2	+ 1.5	16	16.6	— 0.3
12	S.	.	17	21	35.18	— 0.14	1	11.02	— 0.08	.	113	9	34.4	+ 2.3	16	14.6	— 2.9
13	W.	.	17	26	0.53	— 0.01	1	10.98	— 0.16	.	113	13	22.2	+ 0.7	16	16.2	— 1.4
14	S.	.	17	30	25.97	— 0.06	1	11.10	— 0.08	.	113	16	43.6	+ 0.6	16	15.5	— 2.2
Dec. 15	W.	.	17	34	51.97	+ 0.21	1	11.12	— 0.09	.	113	19	36.7	+ 0.1	16	16.0	— 1.8
18	S.	.	17	48	10.06	— 0.01	1	11.14	— 0.13	.	113	25	32.7	+ 3.8	16	16.2	— 1.8
20	E.	.	17	57	2.86	— 0.08	1	11.20	— 0.09	.	113	27	3.4	+ 0.7	16	18.2	+ 0.1
21	W.	.	18	1	29.35	— 0.13	1	11.30	0.00	.	113	27	9.2	+ 1.9	16	15.9	— 2.3
Dec. 22	S.	.	18	5	55.94	— 0.13	1	11.26	— 0.04	.	113	26	45.6	+ 2.0	16	16.4	— 1.8
24	E.	.	18	14	49.17	— 0.03	1	11.26	— 0.03	.	113	24	30.0	— 1.3	16	18.0	— 0.3
28	E.	.	18	32	34.36	— 0.06	1	11.34	+ 0.14	.	113	14	27.5	— 0.7	16	16.7	— 1.7
29	W.	.	18	37	0.19	— 0.12	1	11.09	— 0.08	.	113	10	49.2	+ 1.9	16	18.0	— 0.4

M O O N														
DATE		MEAN TIME OF TRANSIT OF CENTER		OBSERVER	LIMB	APPARENT RIGHT ASCENSION OF CENTER			CORR'N TO <i>Am. Eph.</i>	LIMB	GEOCENTRIC N. P. DISTANCE OF CENTER			CORR'N TO <i>Am. Eph.</i>
1888		h	m			h	m	s	s		°	'	"	"
June	18	7	34.96	E.	I	13	25	40.31	+ 0.32	N	93	28	57.6	+ 4.6
Aug.	14	6	4.47	W.	I	15	39	39.61	+ 0.22	N	104	41	27.3	+ 3.2
	16	7	57.43	W.	I	17	40	48.87	+ 0.10	N	110	22	38.6	+ 0.2
Sept.	12	5	52.73	S.	I	17	22	13.22	— 0.09	N	109	59	42.5	+ 4.9
	13	6	50.42	P.	I	18	24	0.30	— 0.13	S	111	16	41.2	— 1.9
Sept.	14	7	47.64	W.	I	19	25	19.80	— 0.15	S	111	9	30.6	+ 1.8
Oct.	10	4	44.66	S.	I	18	4	21.51	+ 0.13	.	.	.	.	.
	17	10	40.73	W.	I	0	28	59.78	— 0.33	S	91	58	7.6	+ 1.0
	30	20	54.18	E.	II	11	35	22.54	— 0.01	.	.	.	.	.
Nov.	6	2	31.53	W.	I	17	37	18.70	+ 0.14	.	.	.	.	.
	11	7	10.34	E.	I	22	36	35.41	— 0.46	S	102	28	25.4	— 2.0
	12	7	56.28	W.	I	23	26	35.94	— 0.33	S	98	9	31.5	— 1.1
Dec.	5	2	16.17	E.	I	19	16	14.79	+ 0.32	.	.	.	.	.
	6	3	16.57	E.	I	20	20	45.07	— 0.03	.	.	.	.	.
Dec.	7	4	13.02	W.	I	21	21	17.40	+ 0.10	S	107	50	14.1	+ 0.6
	13	8	45.85	W.	I	2	18	31.62	— 0.11	S	81	30	49.9	— 0.2
	14	9	28.62	E.	I	3	5	21.75	— 0.21	S	77	27	20.1	— 1.4
	15	10	12.71	W.	I	3	53	30.94	— 0.06	S	73	55	19.3	— 0.6
	28	20	50.74	W.	II	15	24	32.40	— 0.13	.	.	.	.	.

M E R C U R Y													
DATE	OBS'R	PART OBS'D	APPARENT RIGHT ASCENSION OF CENTER			CORR'N TO <i>Am. Eph.</i>	SID. TIME OF TRANSIT OF SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>	PART OBS'D	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO <i>Am. Eph.</i>	VERTICAL SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>
1888			h	m	s	s	s	s		° ' "	"	"	"
June 18	E.	I	7	30	20.26	— 0.41	. .	. .	C	68 24 19.4	+ 1.3	. .	. .
July 24	E.	II	7	1	31.47	— 0.24	. .	. .	C	70 12 27.6	+ 0.1	. .	. .
Aug. 1	W.	II	7	34	7.48	— 0.21	. .	. .	C	69 10 54.8	+ 0.5	. .	. .
6	P.	C	8	6	39.28	— 0.12	. .	. .	C	69 27 12.4	+ 1.4	. .	. .
7	W.	II	8	14	0.58	— 0.08	. .	. .	C	69 37 47.8	+ 2.1	. .	. .
Aug. 8	E.	II	8	21	34.69	— 0.14	. .	. .	C	69 51 1.1	+ 0.6	. .	. .
9	P.	C	8	29	19.83	— 0.09	. .	. .	C	70 6 59.1	+ 1.6	. .	. .
13	W.	II	9	1	29.32	— 0.15	. .	. .	C	71 37 22.4	+ 1.2	. .	. .
30	S.	C	11	3	13.45	+ 0.07	. .	. .	C	82 21 41.0	+ 1.6	. .	. .
Sept. 12	S.	C	12	23	13.51	+ 0.18	. .	. .	C	92 22 54.7	+ 1.5	. .	. .
13	P.	C	12	28	51.05	+ 0.16	. .	. .	C	93 7 12.7	+ 1.9	. .	. .
14	W.	C	12	34	25.08	+ 0.23	. .	. .	C	93 51 2.8	+ 1.8	. .	. .
20	W.	I	13	6	39.48	+ 0.14	. .	. .	C	98 3 3.7	+ 3.1	. .	. .
21	S.	C	13	11	51.14	+ 0.21	. .	. .	.	. . .	. .	. .	. .
Oct. 4	S.	C	14	14	9.24	+ 0.07	. .	. .	C	106 10 8.5	+ 1.8	. .	. .
10	S.	C	14	37	40.61	+ 0.28	. .	. .	C	108 35 16.1	+ 2.6	. .	. .
Nov. 21	E.	II	14	42	11.03	+ 0.23	. .	. .	C	103 36 15.0	+ 1.9	. .	. .
29	S.	C	15	27	0.91	+ 0.16	. .	. .	C	107 34 36.6	+ 2.4	. .	. .
Dec. 6	W.	C	16	10	21.16	+ 0.21	. .	. .	C	110 41 52.6	+ 0.6	. .	. .
11	S.	C	16	42	47.73	+ 0.32	. .	. .	C	112 29 45.4	+ 0.4	. .	. .
12	W.	C	16	49	24.61	+ 0.38	. .	. .	.	. . .	. .	. .	. .
13	S.	C	16	56	3.60	+ 0.19	. .	. .	C	113 5 36.0	+ 2.4	. .	. .
17	S.	C	17	23	2.98	+ 0.52	. .	. .	C	114 3 20.0	+ 2.4	. .	. .

VENUS

DATE	OBS'R	PART OBS'D	APPARENT RIGHT ASCENSION OF CENTER	CORR'N TO <i>Am. Eph.</i>	SID. TIME OF TRANSIT OF SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>	PART OBS'D	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO <i>Am. Eph.</i>	VERTICAL SEMIDIAM.	CORR'N TO <i>Am. Eph.</i>
1888			h m s	s	s	s		° ' "	"	"	"
Aug. 2	W.	.	9 18 53.59	+ 0.01	0.26	— 0.09	.	72 56 12.7	+ 1.6	5.3	+ 0.3
16	W.	.	10 26 16.19	0.00	0.27	— 0.07	.	78 39 58.2	+ 1.2	5.3	+ 0.3
25	E.	I	11 7 56.95	— 0.13	.	.	.	82 54 25.7	+ 1.5	5.4	+ 0.3
28	S.	.	11 21 38.38	— 0.04	0.40	+ 0.06	.	84 23 10.3	+ 1.4	5.8	+ 0.7
30	S.	.	11 30 43.44	— 0.02	0.36	+ 0.01	.	85 23 10.1	+ 2.8	4.9	— 0.2
Sept. 12	S.	.	12 29 20.68	+ 0.02	0.34	— 0.01	.	92 1 43.6	+ 1.6	7.6	+ 2.3
13	P.	I	12 33 51.09	+ 0.19	.	.	C	92 32 32.3	+ 0.3	.	.
14	W.	I	12 38 21.35	+ 0.06	.	.	C	93 3 21.9	+ 2.2	.	.
20	W.	I	13 5 29.39	— 0.09	.	.	S	96 6 41.5	+ 3.0	.	.
Sept. 21	S.	.	13 10 2.28	+ 0.06	0.36	0.00	.	96 36 50.6	+ 0.5	5.0	— 0.4
26	W.	I	13 32 54.37	+ 0.01	.	.	.	99 5 32.5	+ 0.4	5.5	+ 0.1
Oct. 4	S.	.	14 10 8.87	0.00	0.40	+ 0.02	.	102 52 35.6	+ 1.0	6.0	+ 0.4
10	S.	.	14 38 45.20	0.00	0.30	— 0.09	C	105 30 38.5	+ 0.7	.	.
31	E.	I	16 24 23.36	— 0.03	.	.	C	112 37 53.0	0.0	.	.
Nov. 6	W.	I	16 56 5.99	+ 0.02	.	.	.	113 53 6.4	+ 1.0	6.7	+ 0.5
20	W.	I	18 11 33.05	+ 0.13	.	.	.	115 9 32.6	+ 3.5	8.0	+ 1.4
22	E.	I	18 22 22.19	— 0.11	.	.	C	115 8 33.1	+ 2.8	.	.
Dec. 5	E.	I	19 31 56.14	0.00	.	.	.	113 49 47.3	+ 1.5	7.2	+ 0.2
7	W.	I	19 42 25.62	+ 0.13	.	.	S	113 26 58.0	+ 3.5	.	.
Dec. 12	S.	.	20 8 17.15	— 0.16	0.45	— 0.08	.	112 18 6.1	— 0.2	7.1	— 0.2
13	W.	I	20 13 23.61	0.00	.	.	.	112 2 27.3	+ 1.9	8.7	+ 1.4
14	S.	.	20 18 28.47	+ 0.01	0.63	+ 0.10	.	111 46 8.2	+ 0.6	8.0	+ 0.6
15	W.	I	20 23 31.86	+ 0.02	.	.	.	111 29 16.1	+ 2.6	8.6	+ 1.2
18	S.	.	20 38 32.74	— 0.16	0.56	+ 0.02	.	110 35 1.4	+ 1.2	7.8	+ 0.3
Dec. 20	E.	I	20 48 25.63	— 0.20	.	.	S	109 56 4.0	+ 1.2	.	.
22	S.	.	20 58 12.30	— 0.11	0.55	+ 0.01	.	109 14 59.5	+ 1.9	8.6	+ 0.9
24	E.	I	21 7 52.55	— 0.02	.	.	S	108 31 52.9	+ 2.3	.	.
28	E.	I	21 26 53.35	— 0.20	.	.	S	106 59 57.8	+ 2.5	.	.
29	W.	I	21 31 34.55	— 0.22	.	.	S	106 35 53.0	+ 3.1	.	.

JUPITER

1888			h m s	s	s	s		° ' "	"	"	"
June 18	E.	.	15 44 49.10	+ 0.63	1.64	+ 0.05	.	108 52 59.9	— 4.2	21.2	0.0

NEPTUNE

1888			h m s	s	s	s		° ' "	"	"	"
Dec. 6	E.	.	3 54 54.04	+ 0.31	.	.	.	71 25 2.1	— 1.2	.	.
14	E.	.	3 54 1.78	+ 0.28	.	.	.	71 27 26.8	— 1.8	.	.
20	E.	.	3 53 25.03	+ 0.21	.	.	.	71 29 7.4	— 0.7	.	.
21	W.	.	3 53 19.29	+ 0.32	.	.	.	71 29 22.6	— 1.1	.	.

MINOR PLANETS

IRIS (7)								REMARKS
DATE	OBS'R	WASHINGTON MEAN TIME	BERLIN M. T. CORRECTED FOR ABERRATION	APPARENT RIGHT ASCENSION OF CENTER	CORR'N TO EPHEM.	GEOCENTRIC N. P. DISTANCE OF CENTER	CORR'N TO EPHEM.	
1888		h m	h m	h m s	s	° ' "	"	
Oct. 29	S.	11 42.7	17 37.5	2 18 24.60	+ 9.94	67 48 0.9	— 37.8	} Compared with <i>Berliner Jahrbuch</i> .
30	P.	11 37.9	17 32.7	2 17 36.22	+ 10.05	. . .	. . .	
31	E.	11 33.2	17 28.0	2 16 47.84	+ 10.00	68 4 30.8	— 37.9	
Nov. 1	S.	11 28.4	17 23.2	2 15 59.78	+ 9.98	68 12 59.9	— 37.4	
10	W.	10 46.4	16 41.1	2 9 18.74	+ 9.75	69 33 30.6	— 40.1	
12	W.	10 37.1	16 31.7	. . .	. . .	69 51 48.1	— 38.7	
POLYHYMNIA (33)								
1888		h m	h m	h m s	s	° ' "	"	
Oct. 17	W.	13 10.0	19 2.0	2 58 39.85	— 19.17	71 19 46.6	+ 83.8	} Compared with <i>Berliner Jahrbuch</i> .
29	S.	12 12.2	18 4.2	2 48 0.46	— 19.17	71 50 39.3	+ 86.5	
30	P.	12 7.3	17 59.3	2 47 3.39	— 19.38	. . .	. . .	
31	E.	12 2.4	17 54.4	2 46 6.58	— 19.21	71 56 57.3	+ 86.4	
Nov. 1	S.	11 57.5	17 49.4	2 45 9.62	— 19.16	72 0 11.8	+ 86.8	
10	W.	11 14.0	17 5.7	2 36 51.14	— 18.71	72 28 38.8	+ 88.9	
12	W.	11 4.3	16 55.9	2 35 7.89	— 18.47	72 37 22.9	+ 87.4	
HARMONIA (40)								
1888		h m	h m	h m s	s	° ' "	"	
Oct. 30	P.	11 28.7	17 20.6	2 8 23.14	+ 1.35	. . .	. . .	} Compared with <i>Berliner Jahrbuch</i> .
31	E.	11 23.8	17 15.7	2 7 22.55	+ 1.11	84 10 34.4	— 8.8	
Nov. 1	S.	11 18.8	17 10.7	2 6 22.81	+ 1.24	84 13 50.5	— 8.5	
10	W.	10 35.2	16 26.8	1 57 59.59	+ 1.15	84 36 41.5	— 7.4	
12	W.	10 25.6	16 17.2	1 56 19.70	+ 0.96	84 39 57.2	— 7.8	

COMET 1889 I

DATE	OBSERVER	APPARENT RIGHT ASCENSION	APPARENT N. P. DISTANCE	log $\rho\Delta$	REMARKS
1888		h m s	° ' "		
Oct. 17	W.	6 12 12.91	83 54 16.3	0.6777	} The North Polar Distances have not been corrected for parallax.
Nov. 10	W.	4 34 35.76	90 11 9.5	0.7442	
Dec. 6	E.	1 46 16.60	97 4 8.0	0.8016	
13	W.	1 12 57.08	97 35 24.3	0.8055	
14	E.	1 8 51.18	97 37 28.0	0.8057	

26-INCH EQUATORIAL

RESULTS OF OBSERVATIONS

1888

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN										
HYPERION										
DATE	OBS'R	WASHINGTON MEAN TIME	POSITION ANGLE	NO. OF MEAS.	WT.	WASHINGTON MEAN TIME	DISTANCE	NO. OF MEAS.	WT.	REMARKS
1888		h m	°			h m	"			
Jan. 11	H.	10 12.9	265.69	4	2	10 18.4	253.35	4	2	
18	H.	9 47.8	170.75	4	2	9 52.8	97.98	4	2	
19	H.	9 54.6	135.60	4	2	10 1.6	115.18	4	2	Faint.
21	H.	9 27.3	103.69	4	3	9 33.3	193.82	4	3	
30	H.	9 0.7	285.11	4	2	9 8.7	162.33	4	2	Extremely faint for s. Haze.
Feb. 1	H.	9 37.2	267.75	4	3	9 43.2	246.94	4	3	
2	H.	9 9.7	262.27	4	3	9 17.2	260.38	4	3	Faint.
8	H.	8 56.1	182.82	4	2	9 2.1	100.15	4	2	Very faint.
13	H.	9 0.5	90.65	4	3	9 11.0	234.70	4	3	Faint.
14	H.	8 49.9	84.12	4	2	9 9.4	237.86	4	2	
Feb. 15	H.	8 4.9	77.69	4	2	8 9.9	219.58	4	2	
16	H.	10 24.9	67.28	4	2	10 31.4	175.79	4	2	
18	H.	8 0.4	16.62	5	3	8 7.4	80.41	5	3	Very faint.
28	H.	8 46.7	220.15	4	3	8 53.7	135.09	4	3	Strong moonlight.
Mar. 6	H.	8 6.5	86.75	4	3	8 12.5	233.79	4	3	
Mar. 7	H.	8 8.0	80.02	4	2	8 14.0	222.51	4	2	
8	H.	8 10.0	71.80	4	2	8 16.5	191.45	4	2	
9	H.	7 57.0	59.32	4	3	8 2.5	145.21	4	3	
14	H.	7 18.5	272.32	4	2	7 24.5	215.47	4	2	Windy, and bad images.
15	H.	7 34.4	265.98	4	3	7 40.4	241.90	4	3	
Mar. 17	H.	8 22.9	254.05	4	3	8 28.4	238.97	4	3	
18	H.	8 15.9	247.45	4	3	8 22.4	215.98	4	3	
30	H.	7 22.6	65.60	4	3	7 29.1	158.91	4	3	Faint.
Apr. 1	H.	7 28.0	1.82	4	2	7 35.0	73.51	4	2	Faint.
2	H.	8 11.0	308.92	4	2	8 18.0	99.24	4	2	
Apr. 3	H.	8 11.9	286.58	4	3	8 17.9	149.70	4	3	
4	H.	7 47.4	275.60	4	3	7 54.4	196.02	4	3	Faint.
6	H.	7 35.9	262.45	4	2	7 45.9	238.06	4	2	
7	H.	7 50.3	256.60	4	3	7 59.8	236.97	4	3	
Apr. 7	H.	8 8.3	223.85	4	3	8 14.3	57.62	4	3	TITAN-HYPERION.
8	H.	7 44.8	250.72	4	2	7 51.8	218.00	4	2	Faint.
8	H.	7 58.8	209.60	4	2	8 6.3	39.34	4	2	Faint. TITAN-HYPERION.
12	H.	7 58.2	185.18	4	3	8 5.7	95.14	4	3	
TITAN										
1888		h m	°			h m	"			
Apr. 4	H.	7 33.4	323.62	4	3	7 39.9	75.00	2	3	
28	H.	6 59.3	153.05	4	4	7 4.8	69.89	2	4	
IAPETUS										
1888		h m	°			h m	"			
Mar. 8	H.	8 21.5	61.02	4	2	8 26.0	174.73	4	2	
9	H.	8 8.5	52.55	4	3	8 13.0	135.01	4	3	
12	H.	7 42.5	335.42	4	2	7 46.0	77.67	4	2	Very windy.

CONJUNCTIONS OF SATELLITES OF SATURN WITH MINOR AXIS OF RING

ENCELADUS					
DATE	OBS'R	WASHINGTON MEAN TIME	POS.	WT.	REMARKS
1888 Mar. 15	H.	h m 7 23.9	N.	3	
TETHYS					
1888 Feb. 13	H.	h m 9 19.5	N.	3	
Mar. 18	H.	8 37.9	N.	3	
Apr. 4	H.	8 21.4	N.	3	
DIONE					
1888 Feb. 2	H.	h m 9 4.2	S.	3	
28	H.	8 36.0	N.	3	
RHEA					
1888 Feb. 15	H.	h m 8 59.9	S.	2	

DIMENSIONS OF SATURN'S RINGS

DATE	INNER EDGE OF OUTER RING	OUTER EDGE OF INNER RING	OUTER EDGE OF DUSKY RING	EQUAT. DIAM. OF PLANET
1888 Feb. 2	" 41.00	" 40.13	" 29.98	" 20.98

RESULTS OF OBSERVATIONS OF THE SATELLITES OF MARS

DEIMOS

DATE	OBS'R	WASHINGTON MEAN TIME	POSITION ANGLE	NO. OF MEAS.	WT.	WASHINGTON MEAN TIME	DISTANCE	NO. OF MEAS.	WT.	REMARKS
1888		h m	°			h m	"			
Mar. 30	H.	12 16.1	122.91	5	2	12 27.1	50.51	5	2	Faint.
Apr. 4	H.	12 41.4	118.11	5	2	12 52.4	50.21	5	2	Haze, and satellite very faint.
6	H.	11 19.1	304.13	5	3	11 28.4	52.81	5	3	
8	H.	10 4.3	130.71	5	3	10 12.3	51.26	5	3	
11	H.	10 42.2	296.03	5	3	.	.	.	.	
13	H.	10 10.7	125.97	5	2	10 18.2	52.78	5	2	
16	H.	11 13.1	292.27	5	2	11 22.6	49.67	5	2	Very faint.
20	H.	9 0.5	306.51	5	2	9 7.5	53.73	5	2	Faint.
25	H.	9 19.4	303.31	5	3	9 27.9	52.81	5	3	Extremely faint. Strong moonlight.
May 2	H.	8 53.2	127.65	5	3	9 1.3	51.55	5	3	Faint.
5	H.	9 39.7	292.61	5	3	9 48.7	48.69	5	3	Extremely faint.

PHOBOS

1888		h m	°			h m	"			
Apr. 7	H.	11 21.3	124.6	4	3	11 29.3	20.70	4	3	Very faint.
8	H.	10 44.3	128.9	4	2	.	.	.	.	Extremely faint.
11	H.	11 5.0	.	.	.	.	.	.	.	Sat. visible in $p = 297^\circ$. Clock out of order.
26	H.	10 31.0	301.5	1	3	.	.	.	.	Extremely faint.

RESULTS OF OBSERVATIONS OF DOUBLE STARS										
DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
Nov. 21	Σ 3062	0 0.1	32 14	320.9	4	1.49	2	2	H.	
Dec. 7				319.3	4	1.13	2	2	H.	
15				320.1	4	1.24	2	3	H.	
20				317.4	4	1.48	2	2	H.	
Dec. 24	Σ 2	0 2.7	10 58	3.1	4	0.36	2	2	H.	Not separated. Elongated.
25				4.1	4	0.30	2	2	H.	
Dec. 24	Σ 13	0 9.1	13 41	89.5	4	0.72	2	2	H.	
25				89.0	4	0.86	2	2	H.	
28				89.1	4	0.69	2	2	H.	
Dec. 15	λ Cassiopeæ	0 25.2	36 8	149.2	4	0.47	2	2	H.	Thin clouds.
20				144.8	4	0.54	2	2	H.	
22				145.1	4	0.46	2	3	H.	
Dec. 19	0Σ 18	0 36.0	86 10	123.9	4	1.45	2	2	H.	
20				124.4	4	1.29	2	2	H.	
Dec. 15	η Cassiopeæ	0 41.7	32 49	181.0	4	4.92	2	3	H.	
20				183.1	4	4.95	2	2	H.	
22				184.8	4	4.86	2	3	H.	
23				184.1	4	4.78	2	2	H.	
Dec. 22	Σ 118	1 20.6	7 16	73.8	4	11.99	2	3	H.	
23				74.1	4	12.00	2	2	H.	
Dec. 19	τ Sculptoris	1 30.6	120 31	91.5	4	2.30	2	2	H.	Blurred. Blurred.
20				94.9	4	2.02	2	2	H.	
Jan. 14	Σ 186	1 49.7	88 45	211.2	4	0.41	2	3	H.	
19				213.6	4	0.45	2	2	H.	
Dec. 24				219.0	4	0.53	2	2	H.	Blurred.
25				212.8	4	0.46	2	3	H.	
28				204.5	4	0.45	2	2	H.	Blurred.
Dec. 24	β Cassiopeæ	1 52.1	19 41	305.4	4	0.84	2	2	H.	
25				304.9	4	0.81	2	2	H.	
28				304.3	4	0.75	2	2	H.	
Dec. 19	Σ 208	1 56.8	64 38	52.8	4	1.22	2	2	H.	
20				54.3	4	1.09	2	2	H.	
23				54.6	4	1.07	2	3	H.	
Dec. 25	Anonyma	2 4.9	33 19	331.95	4	59.17	2	3	H.	
Dec. 25	Σ 228	2 6.3	43 5	30.7	4	0.51	2	2	H.	Blurred.
28				22.7	4	0.41	2	2	H.	
Jan. 11	Σ 311 AB	2 42.3	73 0	123.5	4	3.34	2	3	H.	
14				122.1	4	3.39	2	3	H.	
19				123.3	4	3.28	2	2	H.	
Jan. 11	AC	. . .	. .	109.7	4	25.29	2	2	H.	
14				109.7	4	25.06	2	3	H.	
19				109.8	4	25.15	2	2	H.	
Jan. 14	Σ 333	2 52.3	69 9	201.5	4	1.30	2	3	H.	
19				202.2	4	1.18	2	2	H.	
21				199.5	4	1.20	2	2	H.	
Jan. 14	Σ 355	3 0.9	82 4	146.7	4	2.73	2	3	H.	
21				145.6	4	2.76	2	2	H.	
Dec. 19	Σ 360	3 4.5	53 14	136.1	4	1.80	2	2	H.	
20				138.0	4	1.85	2	2	H.	
24				137.6	4	1.80	2	2	H.	
Feb. 1	Σ 367	3 7.9	89 42	234.8	4	0.61	2	3	H.	
2				232.9	4	0.68	2	3	H.	
13				233.6	4	0.62	2	3	H.	
Feb. 1	Σ 380	3 15.3	81 40	70.8	4	1.23	2	3	H.	
2				71.1	4	1.20	2	3	H.	
13				73.9	4	1.13	2	3	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	°	°		"				
Dec. 19	Σ 381	3 16.4	69 28	99.3	4	0.97	2	2	H.	
20				94.9	4	1.06	2	2	H.	
24				98.4	4	1.00	2	2	H.	
Feb. 1	Σ 407	3 24.3	101 32	46.3	4	2.68	2	2	H.	
2				46.2	4	2.82	2	2	H.	
13				49.2	4	2.69	2	3	H.	
Feb. 14	Σ 408	3 24.7	94 42	339.1	4	1.27	2	2	H.	
15				338.4	4	1.24	2	2	H.	
17				339.5	4	1.20	2	3	H.	
Jan. 14	Weisse 3 ^h 564	3 32.0	98 5	331.1	4	1.89	2	3	H.	Faint.
21				332.6	4	1.72	2	2	H.	
Feb. 18	39 Eridani	4 8.7	100 33	150.0	4	6.53	2	3	H.	
22				150.4	4	6.52	2	2	H.	
23				150.0	4	6.26	2	2	H.	Cloudy.
Feb. 1	40 Eridani BC	4 9.8	97 47	107.1	4	3.03	2	3	H.	
2				107.7	4	3.32	2	3	H.	Faint, haze.
13				107.5	4	2.79	2	3	H.	
14				106.5	4	3.03	2	3	H.	
Mar. 4				109.6	4	3.04	2	3	H.	
Feb. 1	AB	. . .	. .	105.6	4	81.93	2	3	H.	
2				105.7	4	81.95	2	3	H.	
13				105.65	4	82.08	2	3	H.	
Feb. 1	AD	. . .	. .	85.0	4	45.19	2	3	H.	
2				84.8	4	44.84	2	3	H.	Faint.
13				84.4	4	44.78	2	3	H.	
Feb. 14	Σ 536	4 16.2	94 58	162.3	4	1.45	2	3	H.	
15				161.9	4	1.60	2	3	H.	
17				162.6	4	1.64	2	3	H.	
Feb. 18	Σ 535	4 16.5	78 55	334.3	4	1.56	2	3	H.	
22				334.2	4	1.56	2	2	H.	
23				335.0	4	1.44	2	2	H.	
Feb. 1	Anonyma	4 38.0	88 9	158.0	4	2.24	2	3	H.	
2				158.2	4	2.41	2	3	H.	
18				157.5	4	2.22	2	3	H.	
Feb. 14	Σ 589	4 38.5	84 56	300.1	4	4.55	2	2	H.	
15				299.5	4	4.62	2	2	H.	
17				300.0	4	4.55	2	3	H.	
Feb. 18	Lalande 9065	4 42.5	111 0	345.3	4	3.61	2	2	H.	Blurred.
22				346.1	4	2.95	2	2	H.	Blurred.
28				345.9	4	3.24	2	3	H.	
Feb. 18	Lalande 9181	4 46.8	95 29	176.6	4	1.09	2	3	H.	
22				359.4	4	1.06	2	2	H.	
28				359.9	4	0.88	2	3	H.	
Feb. 14	Σ 622	4 51.9	88 31	354.2	4	2.41	2	2	H.	
15				353.7	4	2.60	2	2	H.	
17				353.9	4	2.41	2	3	H.	
Feb. 14	ρ Orionis	5 7.0	87 17	64.5	4	6.92	2	3	H.	
15				64.5	4	6.95	2	2	H.	
17				66.0	4	6.83	2	2	H.	
Feb. 28	0Σ 517	5 7.0	88 10	137.7	4	6.87	2	3	H.	
Mar. 4				138.8	4	6.93	2	3	H.	
Feb. 15	Rigel	5 8.8	98 20	201.5	4	9.61	2	2	H.	
17				202.3	4	9.94	2	2	H.	
18				201.9	4	9.55	2	3	H.	
22				202.6	4	9.85	2	2	H.	
Feb. 17	23 Orionis	5 16.5	86 34	28.5	4	32.05	2	2	H.	
18				28.5	4	32.01	2	3	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	°	°		"				
Mar. 8	η Orionis	5 18.4	92 31	89.3	4	1.21	2	2	H.	
9				88.8	4	1.07	2	2	H.	
15				84.3	4	1.10	2	3	H.	
Mar. 8	Σ 735	5 27.0	96 35	352.5	4	39.48	2	3	H.	
9				352.3	4	39.62	2	3	H.	
Feb. 23	λ Orionis	5 28.5	80 9	46.2	4	4.45	2	2	H.	
28				43.3	4	4.41	2	3	H.	
Mar. 4				44.3	4	4.45	2	3	H.	
6				42.2	4	4.47	2	3	H.	
Feb. 28	σ Orionis AC	5 32.7	92 40	236.8	4	11.48	2	3	H.	
Mar. 4				237.2	4	11.44	2	2	H.	
Feb. 28	AB	. . .	. .	84.9	4	12.92	2	3	H.	
Mar. 4				84.7	4	12.74	2	2	H.	
Feb. 18	ζ Orionis	5 34.7	92 0	155.3	4	2.66	2	2	H.	
Mar. 6				158.1	4	2.69	2	3	H.	
7				156.6	4	2.64	2	2	H.	
Mar. 8	South 503	5 49.1	76 4	17.0	4	2.96	2	3	H.	
9				16.7	4	2.93	2	3	H.	
Mar. 6	Lalande 11915	6 8.7	91 41	97.0	4	2.14	2	3	H.	
7				95.7	4	2.13	2	3	H.	
Mar. 6	11 Monocerotis AB	6 23.0	96 57	131.1	4	7.44	2	2	H.	
7				130.5	4	7.37	2	3	H.	
Mar. 6	BC	. . .	. .	104.6	4	2.79	2	2	H.	
7				102.3	4	2.62	2	3	H.	
Mar. 7	O Σ 156	6 38.6	71 39	305.6	4	0.65	2	2	H.	
8				306.9	4	0.68	2	2	H.	
Mar. 9	<i>Sirius</i>	6 39.9	106 33	22.8	5	5.80	3	3	H.	Faint.
Apr. 7				22.2	5	5.89	2	2	H.	Very faint, s uncertain.
13				24.8	5	5.64	2	3	H.	Extremely faint.
Mar. 9	Lalande 13404	6 49.9	87 32	66.7	4	0.99	2	3	H.	
15				65.0	4	1.10	2	3	H.	
Mar. 9	Σ 1097	7 22.1	101 19	164.8	4	0.87	2	2	H.	
15				165.9	4	0.94	2	2	H.	
Mar. 18	O Σ 175	7 26.8	58 47	329.8	4	0.73	2	3	H.	
30				336.0	4	0.70	2	2	H.	Very windy.
Apr. 1				336.5	4	0.71	2	2	H.	
Mar. 15	Σ 1126	7 33.7	84 29	143.3	4	1.22	3	3	H.	
18				142.1	4	1.22	2	2	H.	
30				145.5	4	1.17	2	2	H.	
Mar. 18	O Σ 179	7 37.2	65 19	234.1	4	6.69	2	3	H.	
30				233.0	4	6.68	2	2	H.	
Apr. 2	Σ 1187	8 1.9	57 25	50.4	4	1.97	2	3	H.	
3				50.7	4	2.08	2	3	H.	
6				49.9	4	2.19	2	3	H.	
Mar. 15	ζ Cancr AB	8 5.3	71 59	41.4	4	1.19	2	2	H.	
Apr. 2				48.7	4	0.97	2	2	H.	
3				48.7	4	0.98	2	3	H.	
6				47.4	4	0.97	2	2	H.	
Mar. 15	$\frac{AB}{2}$ C	. . .	. .	123.9	4	5.43	2	2	.	
Apr. 2				124.5	4	5.55	2	2	H.	
3				123.8	4	5.51	2	3	H.	
6				122.3	4	5.69	2	2	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
Apr. 2	ε Hydræ AB	8 40.4	83 9	227.7	4	3.32	2	2	H.	
3				228.0	4	3.22	2	3	H.	
6				227.5	4	3.28	2	2	H.	
7				226.6	4	3.39	2	3	H.	
3	AC	. . .	. .	193.9	4	19.93	2	3	H.	C = 15th mag.
7				194.0	4	19.84	2	3	H.	
Apr. 8	0Σ 197	9 3.3	86 35	61.5	4	1.39	2	3	H.	
13				64.3	4	1.45	2	3	H.	
16				65.3	4	1.37	2	3	H.	
Apr. 8	Σ 1338	9 13.5	51 18	157.8	4	1.61	2	3	H.	
13				157.0	4	1.58	2	3	H.	
17				160.1	4	1.43	2	3	H.	
Apr. 8	0Σ 201	9 16.8	61 34	226.3	4	1.37	2	3	H.	
13				226.5	4	1.37	2	3	H.	
20				227.4	4	1.36	2	2	H.	
Apr. 7	ω Leonis	9 22.0	80 25	96.9	4	0.62	2	2	H.	
8				97.7	4	0.70	2	2	H.	
13				98.5	4	0.74	2	3	H.	
16				98.6	4	0.63	2	2	H.	
24				100.0	4	0.63	2	3	H.	
Apr. 2	Σ 1439	10 23.7	68 36	122.7	4	1.80	2	2	H.	Windy.
3				118.5	4	1.80	2	2	H.	
4				118.5	4	1.74	2	2	H.	
Apr. 24	0Σ 229	10 43.1	48 16	329.0	4	0.89	2	3	H.	
25				320.7	4	1.00	2	2	H.	
26				327.4	4	0.87	2	3	H.	Thin clouds.
Apr. 7	Σ 1504	10 59.2	85 43	105.9	4	1.18	2	2	H.	
13				107.0	4	1.13	2	3	H.	
16				105.3	4	1.00	2	2	H.	
Apr. 20	Σ 1517	11 6.8	69 11	278.0	4	0.55	2	3	H.	
24				277.9	4	0.50	2	3	H.	
27				275.1	4	0.49	2	3	H.	
28				275.2	4	0.57	2	3	H.	
Apr. 3	ξ Ursæ Majoris	11 11.8	57 47	222.7	4	1.74	2	2	H.	
4				222.1	4	1.60	2	2	H.	Windy.
7				222.7	4	1.67	2	3	H.	
13				221.9	4	1.67	2	3	H.	
16				222.7	4	1.53	2	2	H.	
20				222.2	4	1.89	2	3	H.	
24				221.9	4	1.66	2	3	H.	
Apr. 26	Σ 1555 AB	11 30.0	61 33	165.2	4	0.6c	2	3	H.	
27				168.2	4	0.51	2	3	H.	
28				164.9	4	0.56	2	3	H.	
26	$\frac{AB}{2}$ C	. . .	. .	146.5	4	21.22	2	3	H.	
27				146.5	4	21.09	2	3	H.	
Apr. 24	0Σ 237	11 32.5	48 11	269.0	4	1.22	2	2	H.	
25				268.0	4	1.43	2	2	H.	
26				270.1	4	1.08	2	3	H.	
Apr. 24	Σ 1641	12 18.6	51 36	36.1	4	9.16	2	3	H.	
25				35.7	4	9.21	2	2	H.	
26				36.6	4	9.24	2	3	H.	
June 1	Σ 1644	12 20.0	81 47	246.2	4	20.93	2	3	H.	
4				246.0	4	20.82	2	3	H.	
May 1	Σ 1643	12 21.2	62 18	43.9	4	1.86	2	3	H.	
2				44.8	4	1.84	2	3	H.	
3				45.3	4	1.81	2	3	H.	Windy.
5				44.3	4	1.94	2	3	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
June 1	Σ 1668	12 33.3	80 21	197.1	4	1.56	2	3	H.	
4				196.1	4	1.60	2	3	H.	
5				196.6	4	1.63	2	3	H.	
Apr. 26	γ Virginis	12 36.6	90 55	153.9	4	5.58	2	2	.	
27				155.5	4	5.61	2	2	H.	
28				154.3	4	5.42	2	2	H.	
May 1				154.8	4	5.38	2	2	H.	Clouds.
2				154.3	4	5.53	2	2	H.	
Apr. 28	Σ 1703	12 53.1	81 27	279.2	4	18.06	2	2	H.	
May 1				279.7	4	18.23	2	2	H.	
2				279.3	4	18.03	2	3	H.	
May 5	42 Comæ Berenices	13 4.2	71 50	194.7	4	0.48	2	3	H.	
June 1				192.6	4	0.46	2	3	H.	
6				194.1	4	0.42	2	3	H.	
May 1	61 Virginis	13 12.2	107 38.2	27.18	4	204.67	2	2	H.	
2				27.18	4	204.57	2	3	H.	
5				27.02	4	205.18	2	2	H.	
June 6	25 Canum Venaticorum . .	13 32.1	53 6	147.3	4	0.76	2	3	H.	
9				143.9	4	0.72	2	3	H.	
15				146.3	4	0.71	2	3	H.	
May 1	Σ 1785	13 43.6	62 25	232.4	4	1.53	2	2	H.	Clouds.
5				232.9	4	1.62	2	2	H.	
June 1				236.4	4	1.69	2	3	H.	
June 1	Σ 1847	14 22.2	99 40	258.4	4	23.93	2	2	H.	
4				259.7	4	24.23	2	2	H.	
June 6	Σ 1877	14 39.9	62 25	325.7	4	2.91	2	3	H.	
9				326.1	4	2.80	2	2	H.	
12				326.1	4	2.90	2	2	H.	
13				326.8	4	2.83	2	2	H.	
June 1	ξ Bootis	14 45.8	70 24	251.3	4	3.39	2	2	H.	
4				253.0	4	3.31	2	2	H.	
5				251.3	4	3.50	2	2	H.	
June 1	Σ 1909	14 59.9	41 53	241.2	4	4.88	2	2	H.	
4				241.2	4	4.95	2	2	H.	
5				240.4	4	4.88	2	2	H.	
June 6	η Coronæ Borealis	15 18.3	59 17	198.8	4	0.65	2	2	H.	
9				194.4	4	0.64	2	3	H.	
12				194.3	4	0.54	2	3	H.	
13				194.6	4	0.55	2	2	H.	
15				196.3	4	0.71	2	3	H.	
June 6	μ ₂ Bootis	15 20.0	52 14	99.8	4	0.57	2	2	H.	
9				102.1	4	0.66	2	3	H.	
13				99.9	4	0.60	2	2	H.	
15				98.3	4	0.59	2	3	H.	
June 6	ζ Coronæ Borealis	15 34.9	52 58	300.5	4	6.19	2	2	H.	
9				302.1	4	6.35	2	3	H.	
13				303.1	4	6.32	2	2	H.	
15				302.1	4	6.26	2	3	H.	
July 25	ξ Scorpis AB	15 57.8	101 3	20.7	4	0.91	2	3	H.	
25				20.6	4	1.01	2	3	H.	
23	$\frac{AB}{2}$ C			66.1	4	7.19	2	3	H.	
25				64.5	4	7.14	2	2	H.	
July 23	β Scorpis	15 58.5	109 29	24.4	4	13.67	2	3	H.	
25				25.5	4	13.61	2	3	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
July 26	ν Scorpii AB	16 5.0	109 9	5.2	4	0.54	2	3	H.	
28				4.1	4	0.65	2	3	H.	
26	$\frac{AB}{2}$ C	. . .	. . .	336.3	4	40.83	2	3	H.	
28				336.5	4	40.65	2	3	H.	
26	CD	. . .	. . .	49.4	4	2.03	2	3	H.	
28				50.0	4	1.87	2	3	H.	Clouds.
June 5	σ Coronæ Borealis	16 10.3	55 50	206.6	4	3.92	2	2	H.	
6				206.6	4	3.93	2	3	H.	
9				206.6	4	3.86	2	3	H.	
12				206.5	4	3.95	2	2	H.	
June 9	λ Ophiuchi	16 24.9	87 45	47.1	4	1.31	2	2	H.	
15				45.7	4	1.33	2	3	H.	
19				46.3	4	1.21	2	3	H.	
20				48.2	4	1.37	2	2	H.	
July 2				46.3	4	1.43	2	3	H.	
3				43.9	4	1.53	2	2	H.	
13				44.6	4	1.41	2	2	H.	
July 17	Σ 3105	16 25.5	96 47	37.9	4	0.46	2	3	H.	
18				40.5	4	0.45	2	3	H.	
21				43.1	4	0.45	2	3	H.	
June 19	ζ Herculis	16 36.8	58 11	81.2	4	1.53	2	3	H.	
July 2				78.4	4	1.65	2	2	H.	
3				80.9	4	1.50	2	2	H.	
6				78.2	4	1.55	2	2	H.	
13				76.3	4	1.50	2	2	H.	
14				77.1	4	1.39	2	3	H.	
Aug. 3	Σ 2107	16 47.1	61 8	253.6	4	0.40	2	3	H.	
7				254.5	4	0.35	2	3	H.	
July 17	Σ 2120	17 0.0	61 44	247.1	4	6.29	2	3	H.	
18				246.2	4	6.15	2	3	H.	
21				248.4	4	6.14	2	3	H.	
Aug. 2	36 Ophiuchi	17 8.0	116 25	197.5	4	4.33	2	3	H.	
3				197.0	4	4.34	2	3	H.	
July 17	Σ 2173	17 24.2	90 58	163.9	4	0.51	2	3	H.	
18				164.0	4	0.56	2	3	H.	
21				165.2	4	0.51	2	3	H.	
Aug. 10	μ_1 Herculis	17 42.0	62 12	337.3	4	0.36	2	2	H.	
15				338.5	4	0.37	2	3	H.	
24				342.9	4	0.40	2	3	H.	
25				347.1	4	0.42	2	3	H.	
July 17	τ Ophiuchi	17 56.5	98 11	252.9	2	1.81	2	2	H.	
21				253.0	2	1.60	2	3	H.	
23				253.8	2	1.69	2	2	H.	
26				252.7	2	1.62	2	3	H.	
Aug. 1				253.3	2	1.79	2	2	H.	Clouds.
July 17	70 Ophiuchi	17 59.4	87 27	352.3	4	2.11	2	2	H.	
21				353.8	4	2.00	2	3	H.	
23				353.3	4	2.05	2	2	H.	
26				353.7	4	1.95	2	3	H.	
Aug. 1				352.7	4	2.03	2	2	H.	
2				354.9	4	1.98	2	3	H.	
Aug. 23	Σ 2286	18 4.3	89 29	316.5	4	2.60	2	3	H.	
24				316.4	4	2.60	2	2	H.	
25				318.2	4	2.52	2	3	H.	Hazy.

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
Aug. 3	Σ 2306 A $\frac{BC}{2}$	18 15.4	105 9	220.3	4	11.83	2	3	H.	
7				220.3	4	12.04	2	2	H.	
3	BC	. . .	. .	67.0	4	0.74	2	3	H.	
7				69.3	4	0.82	2	2	H.	
Aug. 3	Σ 2315	18 20.2	62 40	222.7	4	0.28	2	3	H.	
7				221.2	4	0.30	2	3	H.	
Aug. 28	OΣ 543	18 22.0	43 11	130.4	4	1.04	2	2	H.	Clouds.
29				131.1	4	1.07	2	2	H.	
Aug. 3	ε ₁ Lyræ	18 40.4	50 27	14.7	4	3.05	2	3	H.	Clouds.
7				14.4	4	3.13	2	3	H.	
10				15.6	4	3.04	2	3	H.	
15				14.5	4	3.08	2	3	H.	
3	ε ₂ Lyræ	. . .	. .	133.9	4	2.34	2	3	H.	
7				133.6	4	2.20	2	3	H.	
10				133.0	4	2.38	2	3	H.	
15				131.5	4	2.29	2	3	H.	
Aug. 2	Σ 2456	19 1.6	51 40	6.1	4	24.76	2	3	H.	Clouds.
3				6.1	4	24.89	2	3	H.	
Aug. 7	Σ 2488	19 10.3	70 11	329.9	4	1.39	2	3	H.	
10				329.3	4	1.47	2	2	H.	
Aug. 7	Σ 2515	19 19.4	68 43	26.3	4	11.86	2	3	H.	
10				26.0	4	11.91	2	3	H.	
Aug. 10	Σ 2524	19 21.6	64 45	100.0	4	6.80	2	3	H.	Clouds.
15				100.3	4	6.87	2	3	H.	
Aug. 15	Σ 2536	19 26.3	72 28	67.6	4	1.84	2	3	H.	Faint, hazy.
23				66.6	4	1.95	2	2	H.	
24				66.9	4	1.92	2	3	H.	
Aug. 15	OΣ 375	19 29.3	72 9	148.3	4	0.49	2	3	H.	
24				149.0	4	0.54	2	2	H.	
25				142.7	4	0.50	2	3	H.	
Sept. 12	δ Cygni	19 41.2	45 10	318.0	4	1.35	2	2	H.	
14				317.5	4	1.36	2	2	H.	
Oct. 3				316.7	4	1.58	2	2	H.	
4				320.3	4	1.53	2	2	H.	
Sept. 12	OΣ 387	19 44.3	55 0	357.9	4	0.53	2	2	H.	
14				359.4	4	0.55	2	2	H.	
Oct. 3				353.0	4	0.54	2	2	H.	
4				354.7	4	0.54	2	2	H.	
Aug. 15	A. C. 16	19 52.9	63 4	232.7	4	0.44	2	3	H.	Right quadrant.
25				235.5	4	0.46	2	3	H.	
29				59.0	4	0.48	2	3	H.	
Aug. 15	OΣ 395	19 56.9	65 24	100.3	4	0.50	2	3	H.	
25				99.4	4	0.63	2	2	H.	
29				100.9	4	0.67	2	3	H.	
Aug. 15	Σ 2666	20 13.9	49 39	243.9	4	2.66	2	3	H.	
23				245.2	4	2.69	2	2	H.	
24				245.1	4	2.57	2	2	H.	
Sept. 12	γ Delphini	20 41.1	74 19	269.7	4	11.14	2	3	H.	
14				270.3	4	11.10	2	3	H.	
Oct. 3				270.1	4	11.03	2	2	H.	
Aug. 25	61 Cygni	21 1.1	51 53	121.3	4	20.95	2	2	H.	Blazing images.
Sept. 14				120.8	4	20.83	2	3	H.	
Oct. 3				120.4	4	20.94	2	2	H.	
4				121.3	4	21.07	2	2	H.	
9				121.05	4	21.01	2	2	H.	
30				120.8	4	20.86	2	3	H.	

RESULTS OF OBSERVATIONS OF DOUBLE STARS—Continued

DATE	NAME OF STAR	APPROX. R. A. 1880.0	APPROX. N. P. D. 1880.0	POSITION ANGLE	NO. OF MEAS.	DISTANCE	NO. OF MEAS.	WT.	OBS'R	REMARKS
1888		h m	° '	°		"				
Sept. 14	Σ 2779	21 9.3	61 25	182.0	4	17.65	2	3	H.	
Oct. 3				182.2	4	17.66	2	2	H.	
4				182.1	4	17.61	2	2	H.	
Sept. 14	0Σ 437	21 15.8	58 4	46.3	4	1.52	2	3	H.	
Oct. 3				48.1	4	1.44	2	2	H.	
4				47.1	4	1.45	2	2	H.	
Oct. 9	Σ 2824	21 39.2	64 54	300.5	4	11.95	2	2	H.	
30				301.2	4	12.19	2	3	H.	
Nov. 1				298.3	4	12.25	2	3	H.	
Nov. 20	Σ 2828 AB	21 43.5	87 9	133.2	4	26.69	2	2	H.	
21				132.9	4	26.43	2	3	H.	
Dec. 1				133.3	4	26.61	2	2	H.	
20	BC	. . .	. .	219.4	4	3.94	2	2	H.	
Nov. 21				218.5	4	3.88	2	3	H.	
Dec. 1				219.2	4	3.69	2	2	H.	
Nov. 21	Σ 2833	21 46.0	81 29	337.7	4	9.15	2	3	H.	
22				338.3	4	9.01	2	3	H.	
Dec. 1				338.6	4	9.15	2	2	H.	
Oct. 30	Σ 2900 AB	22 17.9	69 45	176.6	4	1.77	2	2	H.	
Nov. 1				177.1	4	1.52	2	3	H.	
5				179.6	4	1.76	2	3	H.	
Oct. 30	AC	. . .	. .	327.3	4	64.57	2	3	H.	
Nov. 1				327.3	4	64.52	2	3	H.	
5				327.3	4	64.56	2	3	H.	
Nov. 1	ζ Aquarii	22 22.4	90 40	145.7	4	3.22	2	3	H.	
5				323.1	4	3.34	2	2	H.	
6				326.0	4	3.34	2	3	H.	
Oct. 30	Σ 2910	22 22.5	67 5	341.7	4	5.54	2	2	H.	
Nov. 1				341.6	4	5.40	2	3	H.	
6				341.3	4	5.34	2	3	H.	
Oct. 30	Σ 2928	22 33.2	103 14	136.3	4	4.18	2	2	H.	
Nov. 1				136.0	4	4.08	2	3	H.	
5				134.4	4	4.19	2	2	H.	
Nov. 5	Σ 2943	22 41.3	104 41	115.6	4	27.20	2	2	H.	
6				115.1	4	27.46	2	2	H.	
20				115.5	4	27.28	2	2	H.	
Nov. 20	Σ 2959	22 50.6	93 53	103.6	4	13.45	2	2	H.	A small comp. 10th mag. following B.
21				103.3	4	13.48	2	3	H.	
Nov. 22	0Σ 483	22 53.2	78 55	213.7	4	1.06	2	2	H.	
Dec. 5				217.9	4	1.06	2	2	H.	
Nov. 21	0Σ 500	23 31.7	46 14	322.7	4	0.49	2	3	H.	
22				321.3	4	0.54	2	2	H.	
Dec. 7				323.9	4	0.48	2	3	H.	
Dec. 7	85 Pegasi	23 55.9	63 33	123.4	4	0.75	2	2	H.	
15				122.6	4	0.77	2	3	H.	
20				126.4	4	0.98	2	2	H.	

9.6-INCH EQUATORIAL

RESULTS OF OBSERVATIONS

1888

COMET 1888 I

COMET 1888 I																				
WASH'N MEAN TIME					OBS'R	*	NO. COMP.	COMET* — *		COMET'S APPARENT				log $p\Delta$						
								$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ							
1888	d	h	m	s				m	s	'	"	h	m	s	°	'	"			
Mar.	17	17	18	48.	F.	1	15-3	.	.	.	.	21	16	32.	—14	47	.	.	.	
	18	17	10	34.3	F.	2	25-5	+ 1	49.74	— 0	20.1	21	19	52.68	—13	21	52.5	9.6332 <i>n</i>	0.7810	
	29	17	15	27.2	F.	3	13-4	+ 0	7.89	+ 7	17.8	21	54	52.02	+ 0	48	5.0	9.6072 <i>n</i>	0.7387	
	30	16	24	3.6	F.	{	4	15-3	+ 7	55.18	+ 4	22.7	21	57	51.32	+ 1	54	7.3	} 9.6461 <i>n</i>	0.7372
					5		15-3	— 3	4.61	+ 0	32.3				51.60			7.7		
		16	39	22.4	F.	{	6	15-3	+ 4	7.14	+14	0.2	57	53.67		54	55.9	} 9.6369 <i>n</i>	0.7358	
					5		15-3	— 3	2.72	+ 1	19.0				53.49		54.4			
Apr.	11	15	59	30.0	F.	{	7	19-4	— 1	35.20	—14	18.8	22	33	43.09	+13	43	3.0	} 9.6638 <i>n</i>	0.7091
							8	18-4	— 2	41.03	—12	33.7			43.12		10.5			
							9	20-4	— 5	12.89	+ 1	10.0			43.59		9.5			
		16	26	3.5	F.	10	15-3	+ 0	26.15	— 2	58.9		33	45.60		43	59.1	9.6505 <i>n</i>	0.6482	
	16	16	4	52.3	F.	11	25-5	+ 0	26.75	+ 8	22.6	22	47	49.82	+17	44	24.9	9.6682 <i>n</i>	0.6732	
	23	16	17	26.8	W.	12	29-6	— 1	12.38	— 5	52.7	23	6	34.43	+22	37	48.4	9.6687 <i>n</i>	0.6202	
	26	15	48	46.0	F.	13	25-5	+ 0	53.00	— 7	38.4	23	14	6.71	+24	18	13.9	9.6994 <i>n</i>	0.6694	
May	1	15	54	58.2	T.	14	15-3	— 2	26.66	— 0	15.3	23	26	25.60	+27	20	33.4	9.6925 <i>n</i>	0.5953	
	2	15	41	51.3	F.	15	25-5	+ 2	36.73	+ 5	32.5	23	28	46.38	+27	52	28.5	9.7011 <i>n</i>	0.6077	
	20	15	24	58.8	T.	16	10-2	+ 4	5.99	— 2	42.4	0	7	1.18	+35	57	38.6	9.7313 <i>n</i>	0.5035	
June	3	15	1	19.8	T.	17	12-4	+ 1	54.32	+ 1	6.5	0	30	52.40	+40	46	9.9	9.7539 <i>n</i>	0.4125	
	4	14	51	39.1	F.	18	20-4	— 2	29.50	— 2	1.0	0	32	22.67	+41	4	45.5	9.7532 <i>n</i>	0.3956	
	5	12	0	45.4	F.	19	12-4	+ 0	26.14	+ 2	30.5	0	33	40.19	+41	20	54.3	9.7504 <i>n</i>	0.7777	
		15	6	12.1	T.	20	10-2	— 2	36.27	+ 2	39.1		33	52.57		23	21.7	9.7505 <i>n</i>	0.3923	
	7	11	42	45.8	F.	21	20-4	— 2	6.89	+ 3	41.6	0	36	32.63	+41	56	33.2	9.7431 <i>n</i>	0.7896	
	10	14	35	50.0	T.	22	35-7	— 1	30.63	+ 3	49.2	0	40	50.03	+41	51	0.4	9.7735 <i>n</i>	0.4038	
	11	14	23	24.0	T.	23	30-6	+ 2	42.54	— 8	20.9	0	42	6.91	+43	7	42.4	9.7813 <i>n</i>	0.4319	
	12	11	32	11.5	F.	{	24	19-4	— 1	58.51	+ 3	8.7	0	43	14.38	+43	22	39.4	} 9.7571 <i>n</i>	0.7811
					25		20-4	— 3	29.04	+ 2	12.1				14.52			33.3		
	15	15	5	37.7	T.	26	14-3	+ 7	7.15	— 0	37.2	0	47	6.10	+44	14	9.4	9.7466 <i>n</i>	0.2000	
	16	15	2	5.9	T.	27	20-4	+ 4	13.12	+ 6	34.1	0	48	16.05	+44	29	47.4	9.7480 <i>n</i>	0.1890	
July	2	11	30	22.7	F.	28	20-4	— 0	48.71	— 7	46.3	1	2	31.27	+48	19	27.7	9.8311 <i>n</i>	0.701	

Mean Places for 1888.0 of Comparison-stars

*	1888.0			RED. TO APPARENT			AUTHORITY	REMARKS
	α			δ				
	h	m	s	°	'	"	s	"
1								
2	21	18	4.19	—13	21	29.6	—1.25	—2.8
3	21	54	45.29	+9	40	55.5	—1.16	—6.3
4	21	49	57.15	+1	49	51.0	—1.01	—6.4
5	22	0	57.26	+1	53	42.0	—1.05	—6.6
6	21	53	47.55	+1	41	2.2	—1.02	—6.5
7	22	35	19.20	+13	57	30.9	—0.89	—9.1
8	22	36	25.09	+13	55	52.9	—0.89	—9.2
9	22	38	57.38	+13	42	8.2	—0.90	—8.7
10	22	33	20.34	+13	47	7.1	—0.89	—9.1
11	22	47	23.86	+17	36	12.0	—0.79	—9.7
12	23	7	47.55	+22	43	51.7	—0.74	—10.6
13	23	13	14.41	+24	36	3.2	—0.70	—10.9
14	23	28	52.83	+27	20	59.8	—0.57	—11.1
15	23	26	10.23	+27	47	7.2	—0.58	—11.2
16	0	2	55.51	+36	0	33.4	—0.32	—12.4
17	0	28	58.04	+40	45	15.7	+0.04	—12.3
18	0	34	52.15	+41	6	58.9	+0.02	—12.4
19	0	33	13.98	+41	18	36.1	+0.07	—12.3
20	0	36	28.88	+41	20	54.9	+0.06	—12.3
21	0	38	39.33	+41	53	3.9	+0.19	—12.3
22	0	39	19.18	+42	47	23.4	+0.22	—12.2
23	0	39	24.10	+43	16	15.5	+0.27	—12.2
24	0	45	12.63	+43	19	42.8	+0.26	—12.1
25	0	46	43.31	+43	20	33.3	+0.25	—12.1
26	0	39	58.54	+44	14	58.6	+0.41	—12.2
27	0	44	2.51	+44	23	25.3	+0.42	—12.0
28	1	3	19.02	+48	27	25.3	+0.96	—11.3

a Aquilæ
 $\frac{1}{2}$ (Yarnall + Gould)
 $\frac{1}{2}$ Weisse + Lamont)
Weisse 21^h 1128
Bonn VI + 1° 4584
Bonn VI + 1° 4568
 $\frac{1}{4}$ (W. + Rüm. + Lam. + Grant)
 $\frac{1}{3}$ (W. + Rüm. + Lam.)
 $\frac{1}{2}$ (Weisse + Grant)
Weisse 22^h 670
Bonn VI + 17° 4822
Bonn VI + 22° 4793
Weisse (2) 23^h 233
Weisse (2) 23^h 517
Weisse (2) 23^h 524
Weisse (2) 23^h 477
Weisse (2) 0^h 689
Weisse (2) 0^h 864
Weisse (2) 0^h 816
Weisse (2) 0^h 912
Weisse (2) 0^h 967
Weisse (2) 0^h 978
Bonn VI + 43° 144
Weisse (2) 0^h 1121
Weisse (2) 0^h 1156
Weisse (2) 0^h 998
Weisse (2) 0^h 1088
O. Arg. N. 1155

Comet's apparent place on March 17 deduced from *a* Aquilæ and the circles.

COMET 1888 III

WASH'N MEAN TIME					OBS'R	*	NO. COMP.	COMET — *		COMET'S APPARENT		log $p\Delta$	
								$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ
1888	d	h	m	s				m s	' "	h m s	° ' "		
Aug.	11	9	6	8.4	F.	1	14-3	— 1 4.81	+ 7 20.3	10 38 54.36	+44 48 59.9	9.7585	0.7913
	23	8	4	2.8	W.	2	17-5	— 0 44.43	+ 1 56.2	12 10 46.	+44 47 . .	9.7898	0.6056
	24	8	7	42.1	W.	3	30-6	+ 0 54.19	— 2 4.1	12 19 16.00	+41 18 26.3	9.7838	0.5591
Sept.	2	8	6	30.2	W.	4	33-7	— 1 25.69	+ 3 46.3	13 20 16.49	+35 48 2.1	9.7512	0.6098

Mean Places for 1888.0 of Comparison-stars

*	1888.0			RED. TO APPARENT		AUTHORITY	REMARKS
	α	δ		α	δ		
	h m s	° ' "	s "				
1	10 39 59.95	+44 41 35.6	— 0.78	+ 4.0	Radcliffe 2554.		
2	12 12 31.	+41 45 . .	— 0.54	+ 5.3	BD + 41° 2285.		
3	12 18 22.36	+41 20 24.8	— 0.55	+ 5.6	Weisse (2) 12 ^h 346.		
4	13 21 42.43	+35 44 8.1	— 0.25	+ 7.7	Weisse (2) 13 ^h 410.		

COMET 1889 I

WASH'N MEAN TIME					OBS'R		NO. COMP.	COMET — *		COMET'S APPARENT		log $p\Delta$	
								$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ
1888	d	h	m	s				m s	' "	h m s	° ' "		
Sept.	12	15	48	55.1	W.	1	54-10	+ 0 19.60	+ 11 58.9	6 50 36.58	+ 10 18 1.9	9.5698 n	0.6710
	13	15	25	54.2	T.	2	24-5	— 6 12.06	— 1 11.7	6 50 17.	+ 10 14 . .	9.5961 n	0.6721
	19	15	32	11.5	W.	3	20-5	— 0 55.00	+ 4 38.3	6 47 51.40	+ 9 43 2.7	9.5482 n	0.6709
		16	9	22.8	W.	4	22-5	— 1 13.25	— 4 38.9	47 50.49	42 45.8	9.4761 n	0.6584
	29	15	4	34.3	T.	5	15-3	— 6 1.63	+ 15 54.1	6 40 50.17	+ 9 3 52.6	9.5325 n	0.6739
Oct.	2	15	44	31.4	T.	6	30-6	— 3 2.92	— 7 45.3	6 37 33.29	+ 8 21 7.2	9.6079 n	0.6971
	3	15	46	0.3	T.	7	20-4	— 4 48.78	+ 4 34.5	6 36 27.59	+ 8 13 59.6	9.5101 n	0.6776
	4	16	9	30.0	T.	7	15-3	— 6 5.93	— 3 26.9	6 35 10.46	+ 8 5 58.2	9.2399 n	0.6773
	6	16	58	48.2	T.	8	10-2	+ 3 45.04	+ 6 7.0	6 47 28.	+ 7 52 . .	8.9347 n	0.6598
	8	14	14	51.3	T.	9	25-5	+ 1 17.48	+ 0 37.8	6 28 10.06	+ 7 25 29.7	9.5182 n	0.6857
	12	14	45	22.9	T.	10	20-4	— 2 50.63	+ 6 1.6	6 22 55.80	+ 6 57 56.2	9.6119 n	0.7068
	13	13	49	48.0	T.	10	25-5	— 4 41.10	— 3 19.2	6 21 5.35	+ 6 48 35.4	9.5121 n	0.6906
	17	16	34	33.2	T.	11	20-4	+ 2 49.49	— 0 17.8	6 12 11.51	+ 6 5 46.5	8.3690	0.6779
		17	24	39.4	W.	12	15-3	+ 0 54.16	— 1 59.5	12 6.60	5 18.1	9.0912	0.6903
	28	14	14	31.4	T.	13	30-6	+ 3 9.78	— 0 0.3	5 42 1.19	+ 3 46 58.3	9.0416	0.7052
	30	15	0	44.6	T.	14	20-4	+ 5 10.40	— 1 12.8	5 34 34.87	+ 3 11 8.6	8.3197	0.7105
Dec.	4	9	2	16.1	F.	15	20-4	— 4 39.20	+ 4 44.2	1 57 18.59	— 6 48 53.0	7.6581	0.7997
	11	9	52	8.5	F.	16	17-4	+ 2 31.00	— 0 0.5	1 21 16.10	— 7 29 51.0	9.3499	0.7584
	20	7	17	47.7	F.	17	20-4	+ 1 2.15	+ 2 53.5	0 47 18.33	— 7 40 59.1	8.7801	0.8054
	24	9	23	23.9	F.	18	20-4	— 1 34.32	— 7 48.8	0 35 24.91	— 7 36 20.1	9.5177	0.7867

Mean Places for 1888.0 of Comparison-stars

*	1888.0		RED. TO APPARENT		AUTHORITY	REMARKS
	α	δ	α	δ		
	h m s	° ' "	s	"		
1	6 50 16.16	+ 10 6 3.6	+ 0.82	— 0.6	Bonn VI + 10° 1335.	
2	6 56 28.	+ 10 16 . .	+ 0.83	— 0.8	BD + 10° 1384.	
3	6 48 45.37	+ 9 38 24.6	+ 1.03	— 0.2	Σ (P M) 986.	
4	6 49 2.71	+ 9 47 25.0	+ 1.03	— 0.3	Weisse 6 ^h 1437.	
5	6 46 50.47	+ 8 47 58.7	+ 1.03	— 0.2	Grant 1676.	
6	6 40 34.76	+ 8 28 52.3	+ 1.45	+ 0.2	Grant 1647.	
7	6 41 14.90	+ 8 29 24.9	+ 1.47	+ 0.2	Grant 1649.	
8	6 43 41.	+ 7 58 . .	+ 1.49	+ 0.2		
9	6 26 50.90	+ 7 24 51.2	+ 1.52	+ 0.1	BD + 7° 1467.	
			+ 1.68	+ 0.7	½ (Grant + Harv. Col.).	
10	6 25 44.61	+ 6 51 53.9	+ 1.82	+ 0.7	Schjellerup 2241.	
			+ 1.84	+ 0.7		
11	6 9 40.00	+ 6 6 2.8	+ 2.02	+ 1.5	Schjellerup 2109.	
12	6 11 10.44	+ 6 7 16.1	+ 2.02	+ 1.5	Weisse 6 ^h 256.	
13	5 38 48.96	+ 3 46 55.6	+ 2.45	+ 3.0	Weisse 5 ^h 950.	
14	5 25 21.94	+ 3 12 17.9	+ 2.53	+ 3.5	Grant 1348.	
15	2 1 55.06	— 6 53 46.1	+ 2.73	+ 8.9	Weisse 1 ^h 1077.	
16	1 18 42.61	— 7 29 59.9	+ 2.49	+ 9.4	Weisse 1 ^h 271.	
17	0 46 14.12	— 7 44 2.5	+ 2.06	+ 9.9	Lamont 51.	
18	0 36 57.10	— 7 28 40.7	+ 2.13	+ 9.4	Schjellerup 243.	

COMET 1888 V

WASH'N MEAN TIME					OBS'R	*	NO. COMP.	COMET — *		COMET'S APPARENT		log $p\Delta$	
								$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ
1888	d	h	m	s				m s	' "	h m s	° ' "		
Nov.	1	16	31	44.3	T.	1	10-2	— 4 20.77	— 0 47.0	9 46 14.35	— 15 1 38.0	9.5713 ⁿ	0.8095
	11	15	57	37.7	T.	2	15-3	+ 7 3.13	+ 4 24.7	10 0 9.48	— 13 19 56.9	9.5537 ⁿ	0.8072
	20	17	32	13.6	F.	3	10-2	+ 1 12.26	— 0 15.5	10 10 39.10	— 11 27 40.7	8.8531 ⁿ	0.8306
		17	35	40.8	F.	4	5-1	— 1 35.80	+ 3 32.1	39.66	44.9	8.7944 ⁿ	0.8308
	21	17	39	48.1	F.	5	19-4	+ 1 57.24	+ 0 1.7	10 11 41.69	— 11 14 4.0	8.6988 ⁿ	0.8306
Dec.	1	15	19	28.6	T.	6	40-8	+ 3 6.41	+ 7 14.6	10 20 16.35	— 8 42 40.0	9.4404 ⁿ	0.7893
	4	17	31	17.8	T.	7	20-4	— 2 58.42	+ 4 29.8	10 22 21.63	— 7 47 57.0	8.0847 ⁿ	0.8168
	6	17	8	37.0	T.	8	20-4	— 1 53.34	— 7 29.7	10 23 31.13	— 7 11 26.1	8.2321 ⁿ	0.8024
	13	16	14	2.8	T.	9	20-4	— 0 58.77	— 3 6.5	10 26 38.18	— 4 50 4.0	8.8966 ⁿ	0.6941
	14	16	43	42.5	T.	10	19-4	— 1 21.00	— 9 26.9	10 26 57.86	— 4 37 29.6	8.0284 ⁿ	0.6867
	29	14	44	31.7	W.	11	22-5	— 0 41.76	— 7 12.8	10 27 33.98	+ 1 54 6.0	9.1179 ⁿ	0.7246
		15	25	49.5	W.	12	20-4	+ 3 33.32	— 9 2.1	33.81	54 53.1	8.7975 ⁿ	0.7248

Mean Places for 1888.0 of Comparison-stars

*	1888.0		RED. TO APPARENT		AUTHORITY	REMARKS
	α	δ	α	δ		
	h m s	° ' "	s	"		
1	9 50 33.91	— 15 0 51.5	+ 1.21	+ 0.5	Weisse 9 ^h 1054	
2	9 53 4.89	— 13 24 20.2	+ 1.46	— 1.4	Lalande 19530	
3	10 9 25.19	— 11 27 21.5	+ 1.65	— 3.7	Lalande 19930	
4	10 12 13.82	— 11 31 13.4	+ 1.64	— 3.6	Weisse 10 ^h 175	
5	10 9 42.81	— 11 14 1.8	+ 1.64	— 3.9	Armagh (2) 1189	
6	10 17 7.98	— 8 49 48.0	+ 1.96	— 6.6	Schjellerup 3800	
7	10 25 18.01	— 7 52 19.1	+ 2.04	— 7.7	Lamont 904	
8	10 25 22.36	— 7 3 48.0	+ 2.11	— 8.8	Schjellerup 3850	
9	10 27 34.65	— 4 46 47.0	+ 2.30	— 10.5	Schjellerup 3863	
10	10 28 16.53	— 4 27 52.0	+ 2.33	— 10.7	Yarnall 4397	
11	10 28 12.89	+ 2 1 33.6	+ 2.85	— 14.8	½ (Weisse + Lamont)	
12	10 23 57.66	+ 2 4 9.9	+ 2.83	— 14.7	¼ (Weisse + Lamont + 2 Schjellerup)	

SAPPHO (80)

WASH'N MEAN TIME					OBS'R	*	NO. COMP.	PLANET — *		PLANET'S APPARENT		log $p\Delta$	
								$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ
1888	d	h	m	s				m s	' "	h m s	° ' "		
April	3	11	17	15.4	F.	1	20-4	+ 0 49.64	+ 4 39.3	13 28 17.03	— 13 35 35.4	9.2055 ⁿ	0.8386
	4	11	26	7.9	F.	2	20-4	+ 3 20.83	— 2 27.4	13 27 22.57	— 13 27 53.5	9.1252 ⁿ	0.7772
	7	10	37	28.2	F.	3	20-4	— 2 10.44	+ 9 20.4	13 24 41.93	— 13 4 17.7	9.2991 ⁿ	0.7787
	14	10	50	7.8	F. {	4	20-4	+ 1 55.53	— 6 0.5	13 18 9.81	— 12 5 37.9	9.0330 ⁿ	0.7487
						5	20-4	— 2 38.83	+ 1 56.5	10.83	37.3		
	19	10	13	45.2	F.	6	5-1	+ 0 40.08	+ 3 34.0	13 13 17.76	— 11 22 2.4	9.1178 ⁿ	0.8274

Mean Places for 1888.0 of Comparison-stars

*	1888.0			RED. TO APPARENT			AUTHORITY	REMARKS		
	α	δ		α	δ					
	h	m	s	°	'	"	s	"		
1	13	27	26.12	—13	40	13.5	+ 1.27	— 5.2	Weisse, Santini	These positions, with the exception of No. 3, are taken from Mr. Bryant's list of comparison-stars published in the <i>Monthly Notices</i> of the Royal Astronomical Society, 48:95 (1888).
2	13	24	0.46	—13	25	21.0	+ 1.28	— 5.1	Weisse, Santini, Lamont	
3	13	26	51.07	—13	13	32.9	+ 1.30	— 5.2	Weisse 13 ^h 41 ^m 2 ^s	
4	13	16	12.96	—11	59	32.0	+ 1.32	— 5.4	Gould, Paris 1870	
5	13	20	48.35	—12	7	27.8	+ 1.31	— 6.0	Gould, Yarnall	
6	13	12	56.35	—12	25	30.0	+ 1.33	— 6.4	Weisse, Santini	

PHILIA (280)

WASH'N MEAN TIME		OBS'R	*	NO. COMP.	PLANET — *		PLANET'S APPARENT		log $p\Delta$	
					$\Delta\alpha$	$\Delta\delta$	α	δ	for α	for δ
1888	d h m s				m s	' "	h m s	° ' "		
Nov. 3	10 25 59.4	F.	1	10-2	— 0 56.98	— 2 31.0	1 59 25.04	+13 31 36.8	8.8943"	0.5777

Mean Places for 1888.0 of Comparison-stars

*	1888.0			RED. TO APPARENT		AUTHORITY	REMARKS
	α	δ		α	δ		
	h m s	° ' "		s	"		
1	2 0 19.06	+13 33 54.0	+ 2.96	+13.8	Weisse 1 ^h 10 ^m 39 ^s		

OCCULTATIONS OF STARS BY THE MOON

DATE	OBS'R	STAR	PHASE	LIMB	WASHINGTON TIME		REMARKS
					Sidereal	Mean	
					h m s	h m s	
1888							
Jan. 21	F.	μ Ceti	{ Imm.	D	3 28 51.5	7 25 37.1	The names of the stars are from Struve's list of those occulted during the total lunar eclipse of this date.
			{ Em.	B	4 56 29.8	8 52 1.2	
28	F.	264 Struve	Imm.	Ecl.	2 43 0.6	6 12 22.3	
	F.	271 Struve	Imm.	Ecl.	2 50 24.9	6 19 45.0	
	F.	276 Struve	Imm.	Ecl.	2 59 0.5	6 28 19.6	
	F.	236 Struve	Em.	Ecl.	3 1 6.2	6 30 25.0	
	F.	247 Struve	Em.	Ecl.	3 17 29.4	6 46 45.5	
	F.	284 Struve	Imm.	Ecl.	3 22 51.8	6 52 7.0	Perhaps 2 ^s or 3 ^s late.
	F.	264 Struve	Em.	Ecl.	3 28 31.5	6 57 45.8	
June 18	F.	80 Virginis	{ Imm.	D	5 38 39.5	9 47 45.6	
			{ Em.	B	16 48 38.1	10 55 22.7	
26	F.	γ Capricorni	{ Imm.	B	18 28 40.2	12 5 40.7	
			{ Em.	D	19 46 16.5	13 23 4.3	
Dec. 9	F.	ψ^3 Aquarii	Imm.	B	1 0 38.2	7 43 53.7	

METEOROLOGICAL
OBSERVATIONS AND RESULTS
1888

INTRODUCTION

The meteorological department was under the charge of Commander A. D. BROWN, U. S. N., until he was detached from the Observatory on October 30, 1888. After that date no one was placed in charge of the work.

The observations were made at 0^h, 3^h, 6^h, 9^h, 12^h, 3^h, 6^h, 9^h civil time of the meridian five hours west of Greenwich, by the Observatory watchmen, Messrs. D. HORIGAN, N. CAHILL, and W. HENDERSON, whose skill and experience insure a reasonable degree of accuracy in their work.

The computation of the results and the preparation for publication of the observations and results for 1888 have been made under the direction of Prof. J. R. EASTMAN, U. S. N., by Computer THEODORE I. KING.

INSTRUMENTS

Standard barometer.—The barometer was made by James Green, of New York, and is used only as a standard by which the Newman barometer is occasionally tested. Drawings and description of this instrument will be found in the volume of Washington Observations for 1862.

Newman barometer.—This barometer, in daily use, was made by Newman, and is mounted against the northern wall of the northwest room on the first floor of the Observatory. The barometer is mounted with the usual adjustments at the top and bottom, and is attached by heavy brackets to a substantial mahogany board, which is firmly secured to the wall. The cistern is 103 feet above the mean half tide of the Potomac River. The cistern and tube are of glass, the internal diameter of the former being 3.0 inches and of the latter 0.532 inch.

The scale is attached to a brass rod having the usual adjustment to the surface of the mercury in the cistern. It is silvered and divided to 0.05 inch, and by means of a vernier may be read to 0.002 inch. The temperature of the mercury in the cistern is determined by a small ivory scale thermometer, the bulb of which is constantly immersed in the mercury. The observations with this instrument in 1888, as printed in this volume, have received the constant scale correction of + 0.005 inch, determined in 1864, and have also been reduced to 32° Fahrenheit.

Dry bulb thermometer.—This is a mercurial thermometer by Green, with a bulb 1.5 inches long and 0.2 inch in diameter. The scale is of glass, 12.0 inches long, 0.8

inch wide, and 0.1 inch thick. It is divided to half degrees from $-30^{\circ}.0$ to $+127^{\circ}.0$ Fahrenheit. The printed observations and results for 1888 have received the correction $-0^{\circ}.6$.

For investigation of errors of thermometers see Washington Observations for 1887, Appendix 3.

Wet bulb thermometer.—This instrument is similar to the dry bulb thermometer in materials, construction, and dimensions. Its scale extends from $-35^{\circ}.0$ to $+117^{\circ}.0$ Fahrenheit. The bulb is covered with soft, fine linen, kept moist by the capillary action of a bundle of fine linen fibers that communicate with water in a bird glass placed close beside it. The linen on the bulb is changed before its free action is impaired by dust. The printed observations and results for 1888 have received the correction $-0^{\circ}.6$.

Maximum thermometer.—This is a mercurial thermometer by J. & H. J. Green, No. 4363. It has a brass scale graduated to each degree from -33° to $+123^{\circ}$ Fahrenheit.

At a point a short distance above the bulb, which is spherical, the internal diameter of the tube is so reduced that while with the increase of temperature the mercury passes freely, with the least decrease of temperature the column of mercury is broken at the point of contraction if the instrument is nearly horizontal, and the top of the column marks the highest temperature.

The top of the scale is attached by a metallic clamp to a pivot, around which the thermometer revolves freely in a vertical plane. This pivot is secured to a walnut board fixed to a post, about 3 feet above the ground; and the thermometer is placed nearly horizontal by resting the scale near the bulb on a brass pin in the board.

After each observation the instrument is adjusted by removing the pin and allowing the thermometer to swing freely from the pivot at the top of the scale, which motion is generally sufficient to reunite the column of mercury. The printed observations and results with this instrument in 1888 have received the correction $-0^{\circ}.3$.

Minimum thermometer.—This is a transparent spirit thermometer by James Green, No. 2307, with a spherical bulb about 0.5 inch in diameter. The scale is of silvered brass, and is graduated to degrees from $-67^{\circ}.0$ to $+131^{\circ}.0$ Fahrenheit. The registering index is a short, black, glass cylinder, with a small knob at the extremity farthest from the bulb of the thermometer.

This cylinder is drawn toward the bulb by the decrease of temperature; but when the temperature increases, the spirit flows past the cylinder, which remains at rest at the lowest point reached by the liquid. The end of the knob on the cylinder indicates the lowest point reached by the column of liquid. The thermometer is mounted nearly horizontal, the bulb end about an inch lower than the other. After each observation the bulb end of the instrument is raised until the index moves down to the end of the column of liquid and then the instrument is returned to its normal position. The readings of this thermometer require no correction.

The maximum and minimum thermometers were read at the end (midnight) of each day.

A solar thermometer with blackened bulb, inclosed in a glass tube and bulb of the same form as the thermometer, but about three times its diameter, has been read

during 1888 at the same time as the other thermometers. This instrument, however, has been changed so often, without determining the errors of any of the various instruments used, that it has not been deemed advisable to publish the observations.

SHELTER FOR THERMOMETERS

This building is of wood and painted white throughout. Its form is octagonal, each side being 2.4 feet wide and 6.3 feet high to the eaves. The roof is of tin unpainted on the underside. The ceiling is of thick boards tightly fitted together, and between it and the roof there is an open space freely communicating with the open air. On the north side is the door, which, like the sides, is of double louver work, with a space of about 3 inches between the two divisions. The sides terminate 1 foot from the ground, permitting a free passage of air under the building.

This thermometer shelter is 18.8 yards west of the south wing of the main building of the Observatory and 17.3 yards south of the Transit Circle room.

The dry and wet bulb and the maximum and minimum thermometers are in this building, and are all supported by means of arms and brackets to an upright metallic shaft, which is firmly secured to the ground in the center of the building.

The bulb of the minimum thermometer is 5.8 feet, those of the dry and the wet bulb thermometers are 4.2 feet, and that of the maximum thermometer is 3.2 feet above the ground.

DIRECTION AND VELOCITY OF THE WIND

An ordinary wind vane revolves freely on a spindle at the top of the time ball staff, and the direction of the wind is estimated from the known azimuths of the lines of the main building of the Observatory.

On January 1, 1886, a Robinson anemometer was mounted on the northwest corner of the roof of the Superintendent's house. The cups were 39 feet above the ground. The cups are about 4 inches in diameter and the distance from the center of the axis to the outer edge of the cups is 9.0 inches. The electrical registration of the velocity of the wind is made on a Gibbon recording apparatus mounted in the main building. This apparatus, devised by Lieut. David J. Gibbon, U. S. Army, and adopted for use in the Signal Office, U. S. Army, in 1872, consists of a clock, a cylinder 3.82 inches in diameter and 3.75 inches long, which revolves once in 6 hours, and a recording pencil actuated by the armature of a magnet.

This cylinder is mounted on a horizontal axis, is driven by the clockwork, and by means of a coarse spiral thread on the axis is given a lateral motion of about one-fourth of an inch for each revolution. When a sheet of paper, ruled lengthwise with four diagonal lines and laterally with 72 lines representing every 5 minutes of time, is placed upon the cylinder, and the apparatus adjusted and started, every time the anemometer indicates the motion of the air corresponding to 1 mile the electric current is closed and the pencil makes a lateral mark on the paper. The number of these marks which occur on the paper in the space representing 1 hour indicates the velocity of the wind in miles per hour, or the aggregate distance in miles passed over by the wind in that time. One sheet of paper will contain the record for 24 hours. The

observers were directed to enter in the journal only the number of miles recorded in the hour immediately preceding the hour noted in the journal; for example, the record made at 6^h would be the number of miles registered between 5^h and 6^h. The printed records are simply the exact transcripts from the journal. From the statements of the observers in regard to the care of the anemometer it is feared that the records do not always represent the true hourly velocity.

CLOUDS

In the description of the prevailing forms of clouds, the nomenclature of Howard is used: C., K., S., N., being the symbols for the forms designated *cirrus*, *cumulus*, *stratus*, *nimbus*; and the letters C. S., C. K., etc., indicate the combination *cirro-stratus*, *cirro-cumulus*, etc. The portion of the sky obscured is determined by estimation after a careful scrutiny of the clouds or sky. A clear sky is denoted by 0 and a total obscuration by 10.

RAIN GAUGE

This instrument is placed within the inclosure for the protection of the solar thermometer. It consists of a cylinder 0.8 inch long and 4.1 inches in diameter, soldered to an inverted cone, which is loaded with lead on the outside and near the apex.

The cone rests in an aperture in the horizontal top of an oblong box, and this, aided by the weight of the lead, prevents any disturbance, even during high winds. The top of the gauge is 2.0 feet above the ground, and is free from all shelter, even in driving rain storms.

At the apex of the cone is a small aperture, through which the water passes to a receiving bottle in the box.

The rain is measured in a glass cylinder, with an internal diameter of 0.60 inch, so graduated that the depth of rain can be determined to within 0.002 inch.

The gauge is examined every day, and as the apex of the cone closes the mouth of the bottle except through the small aperture, there is little or no loss by evaporation.

Each inch of snow is assumed to be equal to 0.111 inch of rain; but, whenever practicable, the snow has been melted, and measured in the graduated cylinder.

PRINTED OBSERVATIONS AND RESULTS

The observations and results are collected and printed in the following order:

The *observations* consist of the corrected readings of the barometer, the dry and wet bulb thermometers, the symbols indicating the character of the clouds, the estimated amount of cloudiness, the direction of the wind, and the velocity in miles during the hour ending with the hour of observation, together with the daily mean of the readings of the barometer and thermometers, the estimated cloudiness, and the velocity of the wind.

The *results* are shown in Tables 1 to 6 :

TABLE 1—Contains the *daily* and *monthly* means of the corrected barometer readings.

TABLE 2—Contains the maximum and minimum corrected readings of the barometer, compiled from the *observations*.

TABLE 3—Contains the mean daily temperatures from the corrected readings of the dry bulb thermometer.

TABLE 4—Contains the *observations* and the *results* from the corrected readings of the maximum and minimum thermometers.

TABLE 5—Contains the maximum and minimum temperatures for each month.

TABLE 6—Exhibits the amount of rain and melted snow, and the depth of snow, for each month and for the year.

METEOROLOGICAL OBSERVATIONS 1888

JANUARY 1								JANUARY 2							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.065	30.9	30.4	N.	10	N. E.	1	29.739	39.9	39.6	Fog; K.	10	S.	1	
3	29.994	31.9	31.4	N.	10	N.	1	29.816	36.9	35.4	C. K.	10	N. W.	7	
6	29.873	31.9	31.4	N.	10	N. E.	1	29.894	34.6	30.9	C. K.	9	N. W.	12	
9	29.830	32.9	32.4	N.	10	E., N. E.	2	29.980	31.9	28.4	C. K.	3	N. W.	10	
12	29.804	33.9	33.4	N.	10	N. W.	6	30.018	34.4	29.4	C. K.	3	N. W.	11	
3	29.725	38.9	38.4	K.	10	S. W.	2	30.089	33.4	28.9	C. K.	2	N. W.	12	
6	29.687	40.6	40.4	Fog; K.	10	S. W.	2	30.107	30.4	27.4	S.	1	N. W.	3	
9	29.727	40.9	40.4	Fog; K.	10	N. W.	2	30.067	27.4	26.4	C. K.	8	W.	2	
Means	29.838	35.2	34.8	. .	10.0	. .	2.1	29.964	33.6	30.8	. .	5.8	. .	7.2	
JANUARY 3								JANUARY 4							
0	30.087	26.4	25.4	C. K.	9	N. W.	2	30.203	28.9	27.9	C. K.	6	N. W.	1	
3	30.035	24.9	23.4	C. K.	2	S.	1	30.212	26.9	26.4	C. K.	8	N. W.	1	
6	29.993	25.9	24.4	C. K.	8	S., S. E.	1	30.201	27.4	26.4	C. K.	8	N. W.	1	
9	30.037	27.0	26.4	Clear	0	S. E.	2	30.168	30.9	29.9	C. K.	7	S., S. E.	2	
12	30.050	36.9	32.0	C. K.	8	S. E.	3	30.065	45.4	39.9	C. K.	7	S., S. W.	3	
3	30.069	39.9	34.4	C. K.	3	N. W.	7	29.947	43.9	38.9	C. K.	10	S. W.	6	
6	30.143	35.9	32.4	C. K.	2	N. W.	4	29.940	40.9	37.4	C. K.	10	N. W.	2	
9	30.190	33.4	30.9	C. K.	10	N. W.	5	29.933	35.6	33.4	C. K.	9	N. W.	4	
Means	30.076	31.3	28.7	. .	5.2	. .	3.1	30.084	35.0	32.5	. .	8.1	. .	2.5	
JANUARY 5								JANUARY 6							
0	29.929	32.9	31.4	C. K.	10	N. W.	1	30.265	35.4	33.4	K.	10	N. E.	2	
3	29.953	33.9	32.4	C. K.	10	S.	3	30.251	33.9	31.4	K.	10	N. E.	5	
6	29.981	35.6	33.9	C. K.	10	S.	2	30.214	31.9	30.4	K.	10	E.	4	
9	30.095	37.9	35.9	Fog	10	N., N. E.	2	30.216	31.4	29.4	K.	10	S. E.	2	
12	30.146	41.4	38.4	C. K.	10	N., N. E.	5	30.114	32.4	30.4	K.	10	S., S. E.	4	
3	30.180	41.4	37.9	C. K.	10	N., N. E.	4	30.000	34.9	31.9	C. K.	10	S.	5	
6	30.235	38.9	35.4	K.	10	N., N. E.	3	29.986	36.4	33.9	C. K.	10	S. E.	1	
9	30.271	36.4	33.4	K.	10	N. E.	4	29.963	36.9	33.9	C. K.	9	N. E.	1	
Means	30.099	37.3	34.8	. .	10.0	. .	3.0	30.126	34.2	31.8	. .	9.9	. .	3.0	

JANUARY 7								JANUARY 8							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.930	33.4	32.4	C. K.	9	N. E.	3	29.729	44.9	43.4	C. K.	10	N. W.	2	
3	29.896	32.9	32.2	C. K.	9	N. E.	2	29.678	41.9	42.9	C. K.	10	N. E.	2	
6	29.896	32.4	31.9	C. K.	9	N. E.	2	29.673	42.9	42.4	C. K.	10	N. W.	1	
9	29.867	33.9	32.4	C. K.	10	W., N. W.	1	29.695	45.9	44.4	C. K.	10	N. E.	2	
12	29.799	39.4	37.4	C. K.	10	S. E.	2	29.772	48.4	46.9	C. K.	9	N. W.	3	
3	29.753	45.4	41.4	C. K.	10	N. W.	1	29.863	49.4	45.4	C. K.	7	N. W.	13	
6	29.782	47.9	45.4	C. K.	10	N. W.	3	30.071	43.4	39.4	C. K. S.	9	N. W.	21	
9	29.868	46.0	44.4	C. K.	10	N. W.	1	30.102	41.4	37.4	C. K.	10	N. W.	7	
Means	29.849	38.9	37.2	. .	9.6	. .	1.9	29.823	44.8	42.8	. .	9.4	. .	6.4	
JANUARY 9								JANUARY 10							
0	30.182	39.4	35.4	C. K.	9	W.	5	30.142	30.9	30.6	Mist	10	S. E.	3	
3	30.228	36.4	33.4	C. K.	8	W., N. W.	3	30.011	30.9	30.6	Mist	10	S. E.	5	
6	30.259	34.4	32.4	C. K. S.	4	E.	5	29.942	31.0	30.7	K.	10	S. E.	3	
9	30.348	33.4	31.0	C. K.	10	S. E.	5	29.971	31.9	31.4	K.	10	W.	1	
12	30.355	34.9	31.9	Snow	10	S. E.	4	29.938	38.4	31.9	C. K.	5	S.	2	
3	30.313	31.0	30.0	Snow	10	S. E.	2	29.925	41.4	36.4	C. K.	1	N. W.	9	
6	30.280	30.9	30.6	Mist	10	S. E.	4	29.945	37.4	33.4	Clear	0	N. W.	5	
9	30.229	30.9	30.6	Mist	10	S. E.	4	30.004	33.9	29.9	Clear	0	N. W.	7	
Means	30.278	33.9	31.9	. .	8.9	. .	4.0	29.985	34.5	31.9	. .	5.8	. .	4.4	
JANUARY 11								JANUARY 12							
0	30.015	33.3	28.3	Clear	0	N. W.	13	30.594	15.4	13.4	Clear	0	N. W.	6	
3	30.070	30.4	26.4	Clear	0	N. W.	7	30.639	13.9	11.9	Clear	0	N. W.	5	
6	30.104	29.0	25.4	Clear	0	N. W.	10	30.673	12.4	11.4	Clear	0	N. W.	3	
9	30.196	27.9	24.9	C. K.	2	N. W.	11	30.761	15.4	13.4	C. K.	2	N.	4	
12	30.255	29.9	26.4	C. K.	2	N. W.	10	30.762	25.0	21.4	C. K.	7	E., S. E.	6	
3	30.312	27.9	25.9	Clear	0	N. W.	12	30.710	25.9	32.0	C. K.	9	S. E.	5	
6	30.467	21.9	17.9	S.	1	N. W.	8	30.696	24.4	20.9	C. K.	9	S. E.	8	
9	30.534	17.9	15.4	Clear	0	N. W.	9	30.663	24.9	21.9	C. K.	10	S. E.	9	
Means	30.244	27.3	23.8	. .	0.6	. .	10.0	30.687	19.7	18.3	. .	4.6	. .	5.8	
JANUARY 13								JANUARY 14							
0	30.559	24.9	23.4	Hail	10	S. E.	9	30.274	31.6	30.9	K.	10	N. W.	2	
3	30.449	25.9	25.4	Hail	10	S. E.	4	30.322	28.9	26.4	C. K.	9	N. W.	1	
6	30.340	27.9	27.4	Mist	10	N. E.	2	30.387	25.9	24.4	C. K.	9	N. W.	2	
9	30.255	30.9	29.4	N.	10	N. W.	3	30.463	27.9	26.9	C. K.	3	N. W.	1	
12	30.162	31.9	30.9	N.	10	N. W.	2	30.458	44.4	37.9	C. K.	2	N. E.	5	
3	30.104	33.4	31.4	K.	10	W., S. W.	3	30.429	42.4	37.4	C. K.	2	E.	6	
6	30.118	32.9	32.4	K.	10	S.	1	30.421	36.4	34.4	C. S.	1	E.	2	
9	30.188	33.4	32.9	Fog.	10	S.	0	30.397	31.4	30.9	Clear	0	E.	2	
Means	30.272	30.2	29.2	. .	10.0	. .	3.0	30.394	33.6	31.2	. .	4.5	. .	2.6	

JANUARY 15								JANUARY 16							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER.	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Amt.	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.346	33.9	32.9	K.	10	E.	2	30.407	32.4	28.4	K.	10	N. W.	15	
3	30.282	33.4	32.9	N.	10	N. E.	1	30.531	27.9	24.4	K.	10	N. W.	14	
6	30.188	33.4	32.9	K.	10	N.	2	30.622	22.4	20.4	C. K.	2	N. W.	10	
9	30.134	35.1	34.9	K.	10	S., S. E.	2	30.715	22.4	19.4	C. K.	1	N. W.	8	
12	30.112	39.9	38.9	K.	10	W.	2	30.740	26.4	21.4	C. K.	7	N. W.	4	
3	30.100	45.0	43.4	C. K.	10	S. E.	3	30.681	26.9	21.4	C. K.	10	N.	7	
6	30.173	43.9	42.9	K.	10	N. W.	5	30.735	22.4	19.9	C. K.	10	N. E.	5	
9	30.288	38.9	35.9	K.	10	N. W.	15	30.714	20.8	17.4	C. K.	6	N. E.	6	
Means	30.203	37.9	36.8	. .	10.0	. .	4.0	30.643	25.2	21.6	. .	7.0	. .	8.6	
JANUARY 17								JANUARY 18							
0	30.680	21.3	18.9	C. K.	10	N. E.	4	29.988	25.4	23.9	K.	10	N. W.	3	
3	30.631	19.4	17.4	Snow	10	E.	6	29.962	25.9	24.9	K.	10	N. W.	2	
6	30.553	19.4	17.4	Snow	10	E.	3	29.920	26.4	25.4	K.	10	N. W.	2	
9	30.488	20.9	20.4	Snow	10	N. E.	4	29.917	31.4	28.9	C. K.	10	N. W.	7	
12	30.360	22.9	22.4	N.	10	N., N. E.	4	29.913	30.0	26.4	C. K.	9	N. W.	14	
3	30.219	24.9	24.4	Hail	10	N. E.	3	29.944	27.8	24.4	C. K.	7	N. W.	16	
6	30.117	25.4	24.4	K.	10	N. W.	2	30.008	23.9	21.9	C. K.	3	N. W.	14	
9	30.051	25.4	24.4	C. K.	10	N. W.	2	30.049	20.9	19.9	C. K.	3	N. W.	12	
Means	30.387	22.4	21.2	. .	10.0	. .	3.5	29.963	26.5	24.5	. .	7.8	. .	8.8	
JANUARY 19								JANUARY 20							
0	30.067	20.4	19.4	C. K.	2	N. W.	8	30.070	15.4	13.4	C. K.	1	S.	1	
3	30.094	19.4	18.4	C. K.	2	N. W.	8	30.043	12.9	10.4	Clear	0	N.	2	
6	30.134	18.9	17.4	Clear	0	N. W.	6	30.025	11.4	9.9	Clear	0	N. W.	2	
9	30.192	17.9	15.4	C. K.	1	N. W.	9	30.078	16.9	15.9	C. K.	2	S. W.	1	
12	30.156	21.9	18.4	C. K.	1	N. W.	9	30.049	28.4	25.9	C. K.	6	S. E.	1	
3	30.136	19.9	20.4	C. K.	1	N. W.	5	30.053	35.9	27.9	C. K.	3	S., S. E.	3	
6	30.151	21.9	19.4	C. K.	1	N., N. W.	0	30.101	27.4	25.4	C. K. S.	1	S.	2	
9	30.117	17.4	15.4	C. K.	1	S.	2	30.125	25.9	23.4	C. K.	7	S.	12	
Means	30.131	19.7	18.0	. .	1.1	. .	5.9	30.068	21.8	19.0	. .	2.5	. .	3.0	
JANUARY 21								JANUARY 22							
0	30.133	27.4	25.9	C. K.	10	N.	2	30.521	12.9	11.4	C. K.	4	N. W.	5	
3	30.173	25.4	23.9	K.	10	N.	2	30.554	11.9	10.9	C. K.	4	N. W.	5	
6	30.201	21.4	19.4	K.	10	N. W.	7	30.568	9.9	8.9	C. K.	1	N., N. E.	3	
9	30.022	19.9	17.6	C. K.	6	N. W.	10	30.580	10.9	8.4	C. K.	6	N. E.	4	
12	30.357	22.4	18.9	C. K.	2	N. W.	2	30.546	15.9	13.4	C. K.	10	N. W.	2	
3	30.357	21.7	17.4	C. K.	2	N. W.	7	30.435	17.9	14.9	C. K.	10	W.	1	
6	30.440	17.4	14.9	C. K.	2	N. W.	6	30.489	17.4	15.9	K.	10	S.	1	
9	30.487	14.9	13.4	Clear	0	N. W.	5	30.483	16.9	15.9	C. K.	10	S., S. W.	2	
Means	30.271	21.3	18.9	. .	5.2	. .	5.1	30.522	14.2	12.5	. .	6.9	. .	2.9	

JANUARY 23								JANUARY 24							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.479	18.9	16.9	C. K.	10	S.	1	30.104	22.4	20.4	C. K.	9	S. W.	2	
3	30.439	20.4	17.9	C. K.	10	S.	3	30.114	26.4	24.9	C. K. S.	1	N. W.	4	
6	30.417	20.4	18.4	C. K.	10	S. E.	2	30.168	26.4	25.4	C. S.	3	W.	2	
9	30.403	21.4	19.4	C. K.	10	S. E.	5	30.264	28.6	24.9	Clear	0	N. W.	10	
12	30.324	24.9	21.9	C. K.	10	S. E.	4	30.330	32.9	27.4	Clear	0	N. W.	10	
3	30.231	25.9	23.4	C. K.	10	S. E.	4	30.384	30.4	25.6	C. K.	5	N.	12	
6	30.186	26.4	24.9	K.	10	S. E.	2	30.389	25.9	23.4	C. K.	2	N. W.	4	
9	30.124	26.9	25.4	C. K.	10	S., S. E.	2	30.420	22.9	20.9	C. K.	2	E.	2	
Means	30.325	23.2	21.0	. .	10.0	. .	2.9	30.272	27.0	24.1	. .	2.8	. .	5.8	
JANUARY 25								JANUARY 26							
0	30.431	19.9	18.9	C. K.	3	E.	5	29.622	22.6	20.9	C. K.	4	N. W.	6	
3	30.396	17.9	17.4	C. K.	7	N. E.	4	29.597	20.9	19.4	C. K.	10	N. W.	3	
6	30.363	15.9	15.4	C. K.	5	E.	4	29.620	20.4	18.9	C. K.	9	N. W.	1	
9	30.290	17.9	15.9	C. K.	7	E., S. E.	4	29.676	29.4	24.9	C. K.	4	N. W.	13	
12	30.174	26.4	23.4	C. K.	10	S. E.	3	29.715	29.9	25.9	C. K.	8	N. W.	14	
3	29.988	25.9	23.4	Snow	10	S. E.	6	29.762	28.9	24.9	C. K.	6	N. W.	17	
6	29.795	23.4	23.4	Sleet	10	N.	6	29.829	24.4	21.4	C. K.	3	N. W.	11	
9	29.670	23.6	22.9	C. K.	10	N. W.	3	29.883	20.4	18.4	C. K.	1	N. W.	9	
Means	30.138	21.4	20.1	. .	7.8	. .	4.4	29.713	24.6	21.8	. .	5.6	. .	9.2	
JANUARY 27								JANUARY 28							
0	29.877	18.4	17.4	Clear	0	N. W.	7	29.984	11.9	10.9	Clear	0	N. W.	12	
3	29.883	16.4	15.4	Clear	0	N. W.	6	29.979	9.9	9.4	C. K.	3	N. W.	12	
6	29.859	18.4	17.4	C. K. S.	9	N. W.	8	29.989	8.4	7.9	C. K.	3	N. W.	14	
9	29.874	20.0	17.9	C. K.	10	N. W.	10	30.026	9.4	7.4	Clear	0	N. W.	11	
12	29.840	24.9	21.4	C. K.	7	N. W.	10	30.018	15.9	12.9	Clear	0	N. W.	14	
3	29.802	26.9	22.9	C. K.	7	N. W.	12	30.001	17.4	14.4	Clear	0	N. W.	16	
6	29.891	20.4	18.4	C. K.	2	N. W.	12	30.004	13.4	12.9	Clear	0	N. W.	11	
9	29.956	14.9	13.4	C. K.	2	N. W.	17	30.039	13.9	11.9	Clear	0	N. W.	7	
Means	29.873	20.0	18.0	. .	4.6	. .	10.2	30.005	12.5	11.0	. .	0.8	. .	12.1	
JANUARY 29								JANUARY 30							
0	30.075	12.9	11.4	Clear	0	N. W.	8	29.964	22.4	21.4	N.	10	S. E.	2	
3	30.111	10.4	9.4	Clear	0	N. W.	5	29.960	23.4	22.9	N.	10	S. E.	1	
6	30.125	7.4	5.9	C. K.	3	S.	1	29.952	23.9	23.4	N.	10	S. E.	1	
9	30.165	12.9	10.9	C. K.	2	N. W.	4	29.938	25.2	24.4	C. K.	10	S. E.	1	
12	30.110	23.9	18.9	C. K.	3	N. W.	7	29.887	31.9	28.9	C. K.	9	S. E.	2	
3	30.028	28.4	23.4	C. K.	10	N. W.	4	29.820	36.9	31.8	C. K.	7	S., S. E.	2	
6	30.005	24.4	21.9	Snow	10	N. W.	2	29.850	32.4	31.9	C. K.	5	N. E.	6	
9	29.968	22.9	21.9	N.	10	E.	4	29.850	26.9	25.9	C. K.	4	N. E.	3	
Means	30.073	17.9	15.5	. .	4.8	. .	4.4	29.903	27.9	26.3	. .	8.1	. .	2.2	

JANUARY 31								FEBRUARY 1							
CIVIL TIME	BAROM ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.815	26.4	24.4	C. K.	10	N. E.	2	30.039	33.4	32.4	C. K.	10	N.	2	
3	29.795	27.9	26.9	C. K.	10	N. E.	2	30.082	32.9	31.9	C. K.	10	N. E.	1	
6	29.803	30.4	29.9	N.	10	N. E.	2	30.118	33.0	32.4	K.	10	N.	2	
9	29.883	31.6	31.2	N.	10	N. W.	3	30.189	33.0	32.2	N.	10	N. W.	2	
12	29.874	34.4	31.9	N.	10	N.	2	30.216	33.2	30.9	C. K.	10	N., N. W.	6	
3	29.880	35.4	33.2	N.	10	N. E.	2	30.201	37.9	34.0	C. K.	8	N. W.	6	
6	29.954	34.4	33.4	C. K.	10	N. E.	2	30.251	35.4	32.4	C. K.	4	N. W.	4	
9	30.003	33.4	32.4	C. K.	10	N.	1	30.284	27.4	25.9	Clear	0	N. W.	2	
Means	29.876	31.7	30.4	. .	10.0	. .	2.0	30.172	33.3	31.5	. .	7.8	. .	3.1	
FEBRUARY 2								FEBRUARY 3							
0	30.299	23.9	23.4	C. K.	2	N. W.	2	30.251	22.9	20.9	C. K.	2	N. W.	1	
3	30.329	22.4	21.9	C. K.	4	N. W.	2	30.205	22.4	19.9	C. K.	3	N. W.	1	
6	30.353	22.4	21.9	C. K.	7	N. W.	1	30.184	20.4	18.4	C. K.	3	S. W.	0	
9	30.381	23.8	23.2	C. K.	4	N. W.	3	30.190	23.9	22.4	C. K.	4	S. W.	1	
12	30.358	36.9	35.9	C. K.	1	W	3	30.161	36.9	31.9	C. K.	7	S., S. W.	3	
3	30.309	37.9	33.9	Clear	0	W.	3	30.128	41.4	38.4	C. K.	10	S. E.	1	
6	30.274	34.4	33.9	Clear	0	N.	0	30.160	38.4	35.9	C. K.	10	N., N. W.	1	
9	30.287	26.9	24.4	Clear	0	N. W.	1	30.182	35.9	33.9	C. K.	8	N.	2	
Means	30.324	28.6	27.3	. .	2.2	. .	1.9	30.183	30.3	27.7	. .	5.9	. .	1.2	
FEBRUARY 4								FEBRUARY 5							
0	30.168	34.9	32.9	C. K.	10	N. E.	2	29.605	33.9	33.4	K.	10	N. W.	1	
3	30.139	33.4	32.4	N.	10	N. E.	3	29.631	33.4	32.9	K.	10	N.	1	
6	30.096	32.9	32.4	N.	10	N. E.	3	29.672	33.9	33.4	K.	10	S. W.	1	
9	30.027	33.4	32.9	N.	10	E., N. E.	3	29.754	35.4	34.9	C. K.	9	W., N. W.	1	
12	29.932	33.9	33.4	N.	10	N.	3	29.746	47.9	43.4	C. K.	7	N. W.	9	
3	29.772	35.9	34.9	N.	10	N.	3	29.742	48.9	43.4	C. K.	10	N.	6	
6	29.723	34.9	34.4	N.	10	N. W.	1	29.782	43.9	40.4	C. K.	10	N. W.	3	
9	29.663	34.4	34.2	N.	10	N. W.	1	29.811	39.4	38.4	N.	10	N. W.	4	
Means	29.940	34.2	33.4	. .	10.0	. .	2.4	29.718	39.6	37.5	. .	9.5	. .	3.2	
FEBRUARY 6								FEBRUARY 7							
0	29.811	37.4	36.4	N.	10	N. W.	2	30.007	33.9	31.9	K.	10	E.	7	
3	29.853	35.4	34.9	K.	10	N. W.	2	29.957	34.2	32.4	K.	10	S. E.	7	
6	29.885	37.9	35.9	K.	10	N. W.	8	29.945	33.6	32.2	Mist	10	E.	3	
9	29.981	36.9	34.4	C. K.	8	N. W.	6	29.957	32.4	31.9	Mist	10	N. E.	5	
12	30.020	39.9	35.4	C. K.	6	N., N. W.	7	29.931	33.9	33.4	Mist	10	E.	3	
3	30.006	39.4	34.9	C. K.	9	N., N. W.	4	29.831	35.9	35.4	K.	10	N. E.	2	
6	30.022	36.9	33.4	C. K.	10	N. E.	1	29.828	35.4	34.9	K.	10	N. E.	1	
9	30.034	34.9	33.9	C. K.	10	N. E.	7	29.828	34.4	33.9	K.	10	N. W.	1	
Means	29.952	37.3	34.9	. .	9.1	. .	4.6	29.910	34.2	33.2	. .	10.0	. .	3.6	

FEBRUARY 8								FEBRUARY 9							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.819	33.4	32.9	K.	10	N.	1	29.745	27.9	25.4	Clear	0	N. W.	7	
3	29.750	32.9	32.2	K.	10	N.	1	29.794	27.9	25.4	C. K.	9	N. W.	2	
6	29.683	33.4	32.9	K.	10	S.	1	29.839	27.9	25.4	Snow	10	N. E.	2	
9	29.623	34.0	33.4	N.	10	S. E.	1	29.930	27.9	25.4	Snow	10	S. E.	3	
12	29.572	35.8	35.4	N.	10	N. W.	5	29.932	30.4	28.4	C. K.	10	S. W.	1	
3	29.574	41.0	38.4	C. K.	3	N. W.	4	29.928	32.9	28.9	C. K.	8	N. W.	2	
6	29.608	37.9	33.9	C. K.	2	N. W.	7	30.002	29.6	26.4	C. K.	10	N.	7	
9	29.697	31.9	28.4	Clear	0	N. W.	8	30.089	24.4	21.4	C. K.	9	N. E.	8	
Means	29.666	35.0	33.4	. .	6.9	. .	3.5	29.907	28.6	25.8	. .	8.2	. .	4.0	
FEBRUARY 10								FEBRUARY 11							
0	30.104	21.4	18.9	C. K.	10	N. E.	9	29.978	14.4	13.4	Sleet	10	N. W.	4	
3	30.160	20.4	17.4	Snow	10	N. E.	5	29.902	15.4	14.4	Sleet	10	N.	2	
6	30.162	14.4	13.4	Snow	10	N. E.	6	29.877	16.4	15.4	Sleet	10	N.	3	
9	30.191	14.4	13.9	Snow	10	N. E.	7	29.811	23.9	23.4	Sleet	10	N. W.	3	
12	30.150	14.9	13.9	Snow	10	N. E.	6	29.773	28.4	27.9	N.	10	N. W.	3	
3	30.087	16.9	15.9	Snow	10	N. E.	5	29.759	30.0	29.4	N.	10	N., N. W.	5	
6	30.067	15.9	15.4	Snow	10	N., N. E.	4	29.802	30.9	29.9	K.	10	N. W.	6	
9	30.016	15.4	14.4	K.	10	N., N. E.	4	29.861	30.4	29.9	K.	10	N. W.	8	
Means	30.117	16.7	15.4	. .	10.0	. .	5.8	29.845	23.7	23.0	. .	10.0	. .	4.2	
FEBRUARY 12								FEBRUARY 13							
0	29.900	30.4	29.4	K.	10	N. W.	6	30.018	30.9	30.4	K.	10	N.	2	
3	29.916	30.4	29.4	K.	10	N. W.	4	30.037	28.4	26.4	C. K.	4	N. W.	1	
6	29.938	30.9	30.4	K.	10	N., N. W.	2	30.041	24.9	23.9	C. K.	1	N. W.	2	
9	29.972	31.9	30.9	K.	10	N. E.	3	30.148	24.9	23.9	C. K.	5	N. W.	2	
12	29.997	33.4	31.4	Snow	10	E.	2	30.160	35.9	31.9	C. K.	3	N.	6	
3	29.948	33.9	31.4	K.	10	E.	3	30.137	39.9	36.9	C. K.	2	N. W.	2	
6	29.966	31.9	31.4	K.	10	E.	0	30.117	35.9	33.9	C.	3	N. W.	1	
9	29.989	30.9	30.4	K.	10	N. E.	4	30.120	28.9	27.4	Clear	0	N. W.	2	
Means	29.953	31.7	30.6	. .	10.0	.	3.0	30.097	31.2	29.3	. .	3.5	. .	2.2	
FEBRUARY 14								FEBRUARY 15							
0	30.122	25.4	23.9	Clear	0	N. W.	1	30.025	34.9	33.9	C. K.	10	W.	3	
3	30.099	21.9	20.9	Clear	0	N. W.	3	30.103	44.4	40.4	C. K.	10	N. W.	9	
6	30.120	20.9	20.4	Fog	10	N. W.	1	30.191	36.9	33.4	C. K.	4	N. W.	19	
9	30.113	24.2	23.4	Fog	3	S. E.	0	30.356	30.4	28.4	C. K.	2	N. W.	14	
12	30.066	43.9	33.9	C. K.	3	S. E.	4	30.445	25.9	21.4	Clear	0	N., N. W.	16	
3	29.997	49.4	42.4	C. K.	9	S. E.	3	30.458	26.4	22.4	Clear	0	N. W.	11	
6	29.990	45.9	40.4	C. K.	6	S. W.	2	30.514	22.4	19.4	Clear	0	N. W.	9	
9	30.008	35.9	33.4	C. K.	2	S. W.	3	30.565	19.4	16.9	Clear	0	N. W.	7	
Means	30.064	33.4	29.8	. .	4.1	. .	2.1	30.332	30.1	27.0	. .	3.2	. .	11.0	

FEBRUARY 16								FEBRUARY 17							
CIVIL TIME	BAROM ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.584	16.8	15.4	Clear	0	N. W.	7	30.091	26.4	25.4	Clear	0	S.	1	
3	30.570	13.8	12.4	Clear	0	N. W.	5	29.972	26.9	25.4	Haze	0	S.	3	
6	30.570	12.4	10.9	Clear	0	N. W.	3	29.986	28.4	27.4	Haze	0	S.	2	
9	30.569	14.4	12.9	Clear	0	N.	5	29.934	32.9	31.9	C. K.	7	S., S. E.	3	
12	30.513	24.9	21.9	Clear	0	W.	4	29.920	48.6	40.4	C. K.	6	N. W.	6	
3	30.376	28.9	25.4	Clear	0	S. E.	7	29.853	51.2	42.4	C. K.	7	S., S. E.	5	
6	30.281	27.4	25.9	S.	1	S. E.	3	29.830	45.9	39.9	C. K.	3	S. W.	1	
9	30.207	25.9	23.9	Clear	0	S.	2	29.827	34.4	32.9	C. K.	8	S. W.	3	
Means	30.459	20.6	18.6	. .	0.1	. .	4.5	29.927	36.8	33.2	. .	3.9	. .	3.0	
FEBRUARY 18								FEBRUARY 19							
0	29.817	33.9	32.9	C. K.	10	S. W.	1	30.152	32.9	31.4	Clear	0	N.	2	
3	29.779	32.9	31.4	C. K.	8	N. W.	1	30.198	30.2	28.4	Clear	0	N. W.	2	
6	29.782	30.4	29.4	C. K.	8	N. W.	1	30.219	27.9	26.9	C. K.	3	N. W.	1	
9	29.849	33.4	31.9	C.	2	N. W.	2	30.259	31.4	29.9	C. K.	7	S. W.	2	
12	29.915	49.9	42.9	C. K.	2	N., N. W.	12	30.231	46.9	40.9	C. K.	3	S.	2	
3	29.971	48.9	41.4	Clear	0	N. W.	8	30.160	49.9	43.9	C. K.	8	S.	3	
6	30.058	42.4	38.4	C. K.	1	N.	4	30.130	45.4	42.4	C. K.	10	S. E.	12	
9	30.124	34.6	37.9	C. K.	1	N.	3	30.102	43.4	41.4	C. K.	10	S. E.	2	
Means	29.912	38.3	35.8	. .	4.0	. .	4.0	30.181	38.5	35.6	. .	5.1	. .	3.2	
FEBRUARY 20								FEBRUARY 21							
0	29.996	43.4	41.9	C. K.	10	S. E.	5	29.778	55.4	53.9	C. K.	10	S. W.	4	
3	29.940	42.9	41.9	C. K.	10	S. E.	1	29.828	50.4	45.9	C. K.	7	W.	5	
6	29.922	44.4	43.4	N.	10	S., S. E.	1	29.894	44.4	37.4	C. K. S.	9	N. W.	10	
9	29.880	49.2	48.4	C. K.	10	S.	4	30.016	44.9	38.4	C. K.	10	N. W.	7	
12	29.815	54.9	53.4	N.	10	S.	6	30.071	49.4	40.4	C. K.	9	N. W.	17	
3	29.733	57.4	55.4	C. K.	10	S.	5	30.050	50.9	41.4	C. K.	7	N., N. E.	6	
6	29.709	57.9	56.4	C. K.	9	S. W.	6	30.064	47.9	40.9	C. K.	10	E.	1	
9	29.731	56.4	54.9	C. K.	10	S. W.	5	30.109	43.2	38.9	C. K.	10	S. E.	2	
Means	29.841	50.8	49.5	. .	9.9	. .	4.1	29.976	48.3	42.2	. .	9.0	. .	6.5	
FEBRUARY 22								FEBRUARY 23							
0	30.114	34.4	32.9	C. K.	2	N. W.	3	30.258	38.4	34.9	C. K.	7	N. E.	2	
3	30.118	30.9	27.9	Clear	0	N. W.	3	30.238	33.4	31.9	C. K.	9	N. E.	1	
6	30.152	29.9	27.4	C. K.	1	N. W.	3	30.214	33.4	32.4	C. K.	9	N. E.	4	
9	30.217	34.4	33.4	Clear	0	N. W.	3	30.219	33.7	31.4	C. K.	10	E.	5	
12	30.226	54.9	44.9	Clear	0	N. W.	3	30.151	44.4	38.9	C. K.	9	S.	4	
3	30.194	57.4	45.9	Clear	0	N. W.	5	30.046	51.9	44.8	C. K.	3	S. E.	6	
6	30.209	47.4	41.9	C. K.	3	N. W.	4	30.044	46.4	42.4	C. K. S.	7	S. E.	2	
9	30.245	41.4	37.4	Clear	0	E.	2	30.064	38.9	37.4	C.	2	S. E.	2	
Means	30.184	41.3	36.5	. .	0.8	. .	3.2	30.154	40.1	36.8	. .	7.0	. .	3.2	

FEBRUARY 24								FEBRUARY 25							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.081	33.4	32.4	Clear	0	N. W.	1	29.817	39.9	38.9	N.	10	E.	10	
3	30.070	30.4	29.4	Clear	0	N. W.	2	29.685	40.9	39.3	N.	10	E.	10	
6	30.097	29.9	28.9	C. S.	1	N.	2	29.496	45.9	45.4	N.	10	E.	6	
9	30.145	36.4	34.4	C. K.	9	N. E.	7	29.449	46.4	45.4	N.	10	N. W.	7	
12	30.164	43.9	38.9	C. K.	9	S. E.	8	29.458	51.4	49.4	C. K.	10	N. W.	4	
3	30.085	45.9	40.9	C. K.	9	S. E.	9	29.396	55.9	51.9	C. K.	1	W., N.W.	3	
6	30.052	42.9	38.9	K.	10	S. E.	8	29.454	54.4	51.4	C. K.	9	N. E.	2	
9	29.967	38.9	37.4	N.	10	E.	8	29.485	49.9	47.9	C. K.	9	S. E.	3	
Means	30.083	37.7	35.2	. .	6.0	. .	5.6	29.530	48.1	46.2	. .	8.6	. .	5.6	
FEBRUARY 26								FEBRUARY 27							
0	29.535	47.4	45.4	C. K.	10	N. W.	8	29.777	30.4	29.4	Clear	0	N. E.	1	
3	29.561	42.4	41.4	C. K.	4	N. W.	3	29.763	28.4	27.4	C. K.	10	S. W.	1	
6	29.647	40.9	38.4	C. K.	8	N. W.	2	29.755	30.4	28.4	C. K.	10	N. W.	3	
9	29.692	39.4	33.9	C. K.	9	N. W.	7	29.804	26.6	25.9	Snow	10	N. W.	9	
12	29.703	44.4	37.4	C. K.	5	N. W.	7	29.812	27.4	24.4	K.	10	N. W.	8	
3	29.644	50.9	40.4	C. K.	5	W.	6	29.794	31.9	30.9	C. K.	5	N. W.	10	
6	29.687	41.4	34.4	C. K. S.	7	N. W.	11	29.876	26.4	25.4	C. K.	7	N. W.	12	
9	29.777	34.9	30.9	C. K. S.	4	N. W.	7	29.997	19.9	17.9	C. K.	7	N. W.	14	
Means	29.656	42.7	37.8	. .	6.5	. .	6.4	29.822	27.7	26.2	. .	7.4	. .	7.2	
FEBRUARY 28								FEBRUARY 29							
0	30.118	15.4	13.9	C. K.	2	N. W.	12	30.297	21.9	20.9	C. K.	3	S. E.	1	
3	30.146	14.9	13.4	C. K.	3	N. W.	7	30.251	25.9	23.9	C. K.	10	S.	2	
6	30.225	13.4	11.4	C. K.	2	N. W.	11	30.244	27.9	25.9	C. K.	10	S., S. E.	2	
9	30.325	15.4	12.4	Clear	0	N. W.	13	30.248	29.9	27.4	C. K.	10	S.	0	
12	30.347	23.4	19.9	Clear	0	N. W.	11	30.246	31.9	28.7	C. K.	10	S.	0	
3	30.290	28.9	24.4	Clear	0	N. W.	8	30.215	34.9	30.4	C. K.	10	E.	1	
6	30.296	26.4	23.9	Clear	0	N. W.	3	30.219	34.4	30.9	C. K.	10	E., N. E.	1	
9	30.307	23.9	22.4	Clear	0	S.	1	30.255	33.4	30.4	K.	10	N.	1	
Means	30.257	20.2	17.7	. .	0.9	. .	8.2	30.247	30.0	27.3	. .	9.1	. .	1.0	
MARCH 1								MARCH 2							
0	30.255	32.4	30.4	K.	10	S.	1	30.143	42.9	40.9	C. K.	10	E.	1	
3	30.245	32.9	30.9	C. K.	10	S. W.	0	30.125	40.9	39.4	C. K.	10	N. E.	4	
6	30.261	32.9	31.9	N.	10	N. W.	0	30.142	38.6	36.9	C. K.	10	N. E.	5	
9	30.292	35.4	31.9	K.	10	S.	1	30.190	39.4	36.9	C. K.	9	E., N. E.	5	
12	30.255	45.4	39.9	C. K.	6	S. E.	4	30.152	42.9	40.4	C. K.	10	E.	5	
3	30.188	48.4	42.9	C. K.	10	S. E.	3	30.083	43.9	41.9	C. K.	10	E., S. E.	6	
6	30.159	47.4	43.6	C. K.	7	S.	1	30.043	41.4	39.9	C. K.	10	E., N. E.	5	
9	30.159	45.1	42.4	C. K.	10	S. E.	0	30.019	39.9	38.9	C. K.	10	N. E.	3	
Means	30.227	40.0	36.7	. .	9.1	. .	1.2	30.112	41.2	39.4	. .	9.9	. .	4.2	

MARCH 3								MARCH 4							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.962	38.9	38.4	C. K.	10	S. E.	2	30.112	31.4	27.4	C.	2	N. W.	10	
3	29.923	38.9	38.4	Fog	10	N. W.	2	30.131	29.4	26.4	C. K.	3	N. W.	8	
6	29.971	37.4	36.4	C. K.	3	N. W.	2	30.156	25.4	23.4	C. K. S.	6	N. W.	10	
9	30.039	42.6	38.4	C. K.	3	N. W.	10	30.179	27.9	23.9	C. K.	2	N. W.	11	
12	30.057	47.9	39.4	C. K.	2	N. W.	14	30.144	33.9	28.9	C. K.	2	N. W.	9	
3	30.004	51.4	40.9	Clear	0	N. W.	13	30.074	37.9	31.9	C. K.	2	N. W.	7	
6	30.030	41.4	34.9	C. K. S.	1	N. W.	12	30.057	33.9	33.4	C. K.	3	N. W.	8	
9	30.090	34.9	30.9	Clear	0	N. W.	12	30.057	30.6	26.9	C. K.	3	N. W.	4	
Means	30.010	41.7	37.2	. .	3.6	. .	8.4	30.114	31.3	27.8	. .	2.9	. .	8.4	
MARCH 5								MARCH 6							
0	30.030	29.6	26.4	C. K.	8	S. E.	1	29.853	17.9	16.9	C. K.	3	N. W.	2	
3	29.977	28.4	25.4	C. K.	10	S. E.	5	29.864	12.9	12.4	C. K.	6	N. W.	2	
6	29.935	26.8	24.4	C. K.	10	N.	5	29.901	9.9	8.9	C. K.	9	N. W.	3	
9	29.911	24.4	22.9	Snow	10	N.	3	29.932	17.4	15.9	Clear	0	N. W.	5	
12	29.859	24.4	23.4	Snow	10	N. E.	2	29.930	27.4	22.9	Clear	0	N. W.	8	
3	29.807	23.9	22.4	Snow	10	N.	2	29.891	31.9	26.9	Clear	0	N. W.	7	
6	29.802	22.9	22.4	K.	10	N., N. E.	1	29.902	26.4	23.9	Clear	0	N.	4	
9	29.839	21.9	20.9	C. K.	9	N. W.	4	29.943	18.9	17.4	Clear	0	N. W.	1	
Means	29.895	25.3	23.5	. .	9.6	. .	2.9	29.902	20.3	18.2	. .	2.2	. .	4.0	
MARCH 7								MARCH 8							
0	29.971	17.9	16.4	Clear	0	N. W.	1	29.998	30.4	27.4	Clear	0	N. W.	4	
3	29.974	15.4	14.4	Clear	0	N. W.	1	30.039	30.1	27.0	Clear	0	N. W.	3	
6	29.986	14.4	13.9	Clear	0	N. W.	1	30.063	25.4	23.9	Clear	0	N. W.	1	
9	30.002	22.9	20.9	Clear	0	S. E.	3	30.082	34.4	31.9	C. K.	1	N. W.	9	
12	29.978	33.9	29.9	C. K.	3	W., N. W.	8	30.101	40.4	31.9	C. K.	1	N. W.	11	
3	29.946	37.9	31.9	C. K.	3	N. W.	6	30.069	43.9	32.9	C. K.	1	N. W.	10	
6	29.933	35.9	31.9	C. K.	3	N. W.	6	30.096	39.4	35.4	C. K.	2	N. W.	7	
9	29.975	30.9	27.4	C. K.	2	N. W.	3	30.160	35.9	34.4	Clear	0	N. W.	3	
Means	29.971	26.2	23.3	. .	1.4	. .	3.6	30.076	35.0	30.6	. .	0.6	. .	6.0	
MARCH 9								MARCH 10							
0	30.211	33.4	29.9	Clear	0	N. W.	9	30.345	29.4	28.4	Clear	0	N. W.	3	
3	30.240	30.9	27.4	Clear	0	N. W.	6	30.345	27.4	26.4	Clear	0	N. W.	2	
6	30.276	29.4	26.4	Clear	0	N. W.	7	30.374	25.9	24.9	S.	1	N. W.	2	
9	30.313	35.2	29.4	Clear	0	N. W.	11	30.402	36.4	33.4	C. K.	3	S. E.	4	
12	30.325	43.4	34.9	Clear	0	N. W.	11	30.382	49.9	42.4	C. K.	2	S. E.	4	
3	30.282	48.9	40.2	Clear	0	N. W.	10	30.298	52.4	43.9	C. K.	4	S. E.	7	
6	30.304	43.4	40.4	C. S.	1	N. W.	5	30.245	45.9	38.9	C. K.	10	E., S. E.	5	
9	30.341	36.4	34.4	S.	1	N. W.	3	30.251	41.1	37.4	C. K.	10	S. E.	8	
Means	30.286	37.6	32.9	. .	0.2	. .	7.8	30.330	38.6	34.5	. .	3.8	. .	4.4	

MARCH 11								MARCH 12							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.207	39.4	36.9	C. K.	10	S. E.	6	29.847	28.9	27.9	K.	10	N. W.	19*	
3	30.151	38.4	35.9	N.	10	S. E.	8	29.844	26.9	24.9	C. K.	5	N. W.	15	
6	30.043	37.9	36.9	N.	10	S. E.	5	29.878	24.9	22.9	C. K.	4	N. W.	16	
9	29.934	40.4	39.4	N.	10	E.	5	29.972	23.8	21.4	C. K.	3	N. W.	20	
12	29.845	45.9	45.4	N.	10	E., S. E.	5	29.973	24.9	21.9	C. K.	2	N. W.	20	
3	29.793	41.4	40.9	N.	10	N. W.	11	29.950	25.9	22.4	C. K.	1	N. W.	17	
6	29.799	33.4	32.9	Snow	10	N. W.	19	29.996	22.2	19.4	K. S.	1	N. W.	13	
9	29.818	31.9	31.4	Snow	10	N. W.	22	30.002	18.4	17.4	Clear	0	N. W.	15	
Means	29.949	38.6	37.5	. .	10.0	. .	10.1	29.933	24.5	22.3	. .	3.2	. .	16.9	
MARCH 13								MARCH 14							
0	29.906	16.4	13.4	Clear	0	N. W.	18†	29.764	13.0	11.4	C. K.	6	N. W.	15	
3	29.805	14.9	11.9	Clear	0	N. W.	20	29.749	12.3	10.4	C. K.	10	N. W.	14	
6	29.721	14.4	11.4	C. K. S.	5	N. W.	19	29.739	14.9	12.4	C. K.	10	N. W.	17	
9	29.703	15.9	13.4	C. K.	10	N. W.	18	29.859	20.9	18.4	C. K.	10	N. W.	15	
12	29.677	17.9	15.4	C. K.	10	N. W.	19	29.915	28.9	25.4	C. K.	9	N. W.	16	
3	29.674	18.9	17.4	C. K.	10	N. W.	16	29.923	36.9	30.9	C. K.	1	N. W.	15	
6	29.718	17.2	15.4	C. K.	9	N. W.	16	30.000	33.9	30.9	C. K.	1	N. W.	14	
9	29.758	15.4	14.4	C. K.	9	N. W.	18	30.084	30.4	27.9	Clear	0	N. W.	13	
Means	29.745	16.4	14.1	. .	6.6	. .	18.0	29.879	23.9	21.0	. .	5.9	. .	14.9	
MARCH 15								MARCH 16							
0	30.121	28.4	26.4	Clear	0	N. W.	13	30.063	30.4	28.4	Clear	0	N. W.	2	
3	30.148	27.4	26.4	C. K.	2	N. W.	9	30.007	29.9	28.4	Clear	0	N. W.	1	
6	30.194	29.9	27.4	C. K.	7	N. W.	11	29.976	30.4	28.9	C. K.	10	W., N. W.	2	
9	30.225	34.0	30.4	C. K.	2	N. W.	11	29.940	34.4	33.4	C. K.	10	S., S. E.	4	
12	30.212	40.0	31.9	C. K.	1	N. W.	8	29.871	43.9	39.9	C. K.	10	S. E.	4	
3	30.134	46.9	39.6	Clear	0	N. W.	8	29.722	61.9	57.9	C. K.	7	S. W.	4	
6	30.114	43.4	38.9	Clear	0	W., N. W.	3	29.729	49.9	44.9	N.	10	N. W.	16	
9	30.096	35.9	33.9	Clear	0	N. W.	2	29.757	45.4	41.4	C. K.	4	N. W.	13	
Means	30.156	35.7	31.9	. .	1.5	. .	8.1	29.883	40.8	37.9	. .	6.4	. .	5.8	
MARCH 17								MARCH 18							
0	29.781	41.0	37.4	C. K.	8	N. W.	8	29.809	29.9	28.9	C. K.	2	N. W.	4	
3	29.785	37.9	34.4	C. K.	9	N. W.	13	29.865	27.4	26.4	C. K.	2	N. W.	2	
6	29.797	37.9	34.4	C. K.	9	N. W.	6	29.934	23.9	22.4	Clear	0	N.	3	
9	29.817	38.4	33.9	C. K.	10	N., N. W.	4	30.019	31.3	25.9	Clear	0	N.	6	
12	29.764	42.4	36.9	C. K.	10	N., N. W.	9	30.024	39.9	31.4	Clear	0	N.	4	
3	29.726	43.4	36.9	C. K.	10	N., N. W.	7	29.985	46.4	36.9	C. K.	1	N.	4	
6	29.745	40.9	35.4	C. K.	6	N., N. W.	6	30.007	41.9	33.9	Clear	0	N., N. W.	2	
9	29.777	35.9	31.9	C. K.	2	N. W.	5	30.066	33.9	30.9	C. K.	1	E.	2	
Means	29.774	39.7	35.2	. .	8.0	. .	7.2	29.964	34.3	29.6	. .	0.8	. .	3.4	

* The number of miles per hour registered by the anemometer is evidently incorrect; there must be some trouble with the connection.

† Anemometer evidently still registering incorrectly.

MARCH 19								MARCH 20							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.106	30.4	28.4	Clear	0	N.	1	29.992	46.9	42.9	C. K.	10	S. E.	3	
3	30.124	28.4	27.4	Clear	0	N. E.	2	29.952	47.4	42.9	C. K.	10	S. E.	3	
6	30.148	27.9	26.9	S.	1	E., S. E.	2	29.934	47.4	44.4	N.	10	S.	4	
9	30.168	36.9	33.9	C. K.	2	S. E.	5	29.871	47.9	47.4	N.	10	S.	5	
12	30.142	52.9	45.9	Clear	0	S.	5	29.795	51.4	50.9	N.	10	S.	8	
3	30.067	59.9	51.9	C. K.	3	S., S. E.	8	29.722	53.9	53.4	N.	10	S.	5	
6	30.042	52.9	47.9	C. K.	9	S. E.	9	29.704	56.9	56.2	C. K.	8	S.	5	
9	30.036	46.9	42.4	C. K.	9	S. E.	3	29.700	57.4	56.9	C. K.	9	S.	6	
Means	30.104	42.0	38.1	. .	3.0	. .	4.4	29.834	51.2	49.4	. .	9.6	. .	4.9	
MARCH 21								MARCH 22							
0	29.649	56.9	55.9	C. K.	10	S.	4	29.659	37.9	35.4	C. K.	6	N. W.	2	
3	29.526	57.4	56.4	N.	10	S. E.	6	29.697	39.4	36.4	C. K.	10	N. W.	10	
6	29.390	58.4	57.9	N.	10	S., S. E.	12	29.730	37.4	34.9	C. K.	10	N. W.	5	
9	29.296	60.4	59.0	C. K.	9	S.	8	29.826	34.9	31.9	K.	10	N. W.	9	
12	29.291	64.9	59.9	C. K.	8	S.	13	29.835	34.4	29.4	C. K.	10	N. W.	10	
3	29.337	52.4	49.6	N.	10	N. W.	13	29.857	32.9	29.4	Snow	10	N. W.	11	
6	29.483	45.9	40.4	C. K. S.	10	N. W.	15	29.949	28.0	23.4	C. K.	7	N. W.	17	
9	29.618	42.9	39.4	C. K.	1	N. W.	13	30.064	21.9	19.4	C. K.	4	N. W.	14	
Means	29.449	54.9	52.3	. .	8.5	. .	10.5	29.827	33.4	30.0	. .	8.4	. .	9.8	
MARCH 23								MARCH 24							
0	30.160	17.6	15.9	Clear	0	N. W.	15	30.163	29.4	25.9	C. K.	10	S. E.	3	
3	30.196	16.4	14.4	C. K.	1	N. W.	10	30.112	27.9	25.9	C. K.	9	S. E.	4	
6	30.238	15.9	13.4	C. K.	2	N. W.	15	30.134	25.9	25.4	Snow	10	N. E.	4	
9	30.244	20.9	16.4	C. K.	1	N. W.	14	30.171	27.4	25.9	Snow	10	N. E.	6	
12	30.201	29.4	24.4	C. K.	3	N. W.	13	30.182	31.9	28.9	C. K.	10	N.	4	
3	30.153	33.9	26.9	C. K.	2	N. W.	12	30.162	33.9	30.9	C. K.	10	W.	2	
6	30.150	30.9	26.4	C. K.	4	N. W.	10	30.189	34.9	31.4	K.	10	N. W.	1	
9	30.161	29.9	25.9	C. K.	9	N. W.	4	30.258	32.9	31.4	K.	10	W., N. W.	1	
Means	30.188	24.4	20.5	. .	2.8	. .	11.6	30.171	30.5	28.2	. .	9.9	. .	3.1	
MARCH 25								MARCH 26							
0	30.283	32.9	31.4	K.	10	N. W.	1	30.345	32.2	31.4	N.	10	E.	3	
3	30.311	32.4	31.4	K.	10	N. E.	2	30.263	32.0	31.4	N.	10	E.	4	
6	30.334	32.4	31.4	C. K.	10	E.	4	30.229	32.4	31.4	N.	10	N. E.	5	
9	30.424	30.9	28.9	C. K.	10	N. E.	2	30.248	32.9	32.4	N.	10	N.	4	
12	30.423	35.4	31.9	C. K.	10	N. E.	7	30.104	34.9	32.9	K.	10	E., S. E.	4	
3	30.403	33.9	30.9	Sleet	10	N. E.	7	30.015	36.9	36.4	N.	10	N. W.	3	
6	30.378	33.4	31.4	K.	10	E.	7	30.013	36.4	35.9	N.	10	N.	4	
9	30.373	31.9	30.9	N.	10	E.	5	30.019	37.9	37.4	K.	10	N. W.	2	
Means	30.366	32.9	31.0	. .	10.0	. .	4.4	30.154	34.4	33.6	. .	10.0	. .	3.6	

MARCH 27								MARCH 28							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.021	37.9	37.4	N.	10	N. W.	3	29.883	46.4	45.4	C. K.	10	N.	3	
3	30.024	36.9	36.4	K.	10	N. W.	2	29.859	44.4	43.4	K.	10	N.	3	
6	30.044	37.4	36.9	Fog	10	N. W.	2	29.847	42.9	41.9	K.	10	N., N. E.	2	
9	30.070	41.9	41.4	Fog	10	N.	3	29.861	44.9	43.9	Fog	10	S. E.	1	
12	30.059	47.9	46.9	Fog	10	N., N. E.	2	29.839	50.4	48.9	Fog	10	S. E.	5	
3	30.024	49.9	48.9	Fog	10	W.	2	29.793	54.9	52.9	Fog	10	S. E.	4	
6	29.956	49.4	48.9	N.	10	N. W.	2	29.769	55.4	53.4	Fog	10	S. W.	0	
9	29.936	48.9	48.4	N.	10	N. E.	4	29.741	51.8	50.9	N.	10	E.	3	
Means	30.017	43.8	43.2	. .	10.0	. .	2.5	29.824	48.9	47.6	. .	10.0	. .	2.6	
MARCH 29								MARCH 30							
0	29.731	50.9	50.4	N.	10	N. W.	3	30.094	35.9	34.4	Clear	0	N. W.	3	
3	29.595	50.0	49.4	N.	10	W.	2	30.136	33.4	32.4	Clear	0	N. W.	2	
6	29.672	53.4	51.9	C. K.	10	N. W.	10	30.191	32.4	31.4	C. K.	2	N. W.	2	
9	29.799	45.9	44.9	C. K.	10	N. W.	12	30.231	46.9	42.9	C. K.	2	S. E.	2	
12	29.894	44.9	41.4	C. K.	10	N. W.	6	30.195	60.9	49.9	Clear	0	S.	7	
3	29.918	51.4	45.4	C. K.	6	N. W.	9	30.090	62.9	53.4	Clear	0	S.	9	
6	29.959	50.9	43.9	C. K.	4	N. W.	7	30.032	59.4	49.9	Clear	0	S.	8	
9	30.037	41.9	38.9	C. K.	2	N. W.	4	30.007	51.9	46.9	Clear	0	S.	6	
Means	29.826	48.7	45.8	. .	7.8	. .	6.6	30.122	48.0	42.6	. .	0.5	. .	4.9	
MARCH 31								APRIL 1							
0	29.994	48.4	44.4	Clear	0	S. W.	5	30.006	52.6	43.9	C. K.	9	N. W.	4	
3	29.964	46.4	43.9	Clear	0	S. W.	4	30.045	46.9	43.4	C. K.	7	N. W.	2	
6	29.998	42.9	41.4	Clear	0	S.	2	30.052	42.9	40.9	C. K.	9	E.	1	
9	30.005	55.4	49.9	C. K.	2	S. E.	2	30.055	49.9	44.9	C. K.	6	S.	3	
12	29.957	71.9	57.9	C. K.	2	S. W.	5	29.985	59.9	48.9	C. K.	2	S.	5	
3	29.906	71.4	57.4	C. K.	9	N. W.	6	29.852	61.9	51.9	Clear	0	S.	8	
6	29.936	63.9	55.4	C. K.	9	N. W.	1	29.801	54.9	48.4	C. K.	2	S. E.	15	
9	29.970	58.4	53.4	C. K.	7	S.	1	29.746	47.9	44.9	C. K.	5	S. E.	9	
Means	29.966	57.3	50.5	. .	3.6	. .	3.2	29.943	52.1	45.9	. .	5.0	. .	5.9	
APRIL 2								APRIL 3							
0	29.632	48.9	47.4	C. K.	10	S. E.	3	29.766	56.4	50.9	C. K.	8	W.	5	
3	29.508	47.4	46.4	C. K.	10	S.	2	29.862	53.4	50.4	C. K. S.	7	N.	6	
6	29.466	47.9	47.4	C. K.	9	S. E.	2	29.943	45.9	42.9	C. K. S.	2	N.	4	
9	29.466	64.4	57.9	C. K.	9	S.	3	30.028	49.9	42.4	Clear	0	N., N. E.	7	
12	29.489	77.4	61.4	C. K.	4	N. W.	10	30.057	56.9	45.9	Clear	0	N.	6	
3	29.549	76.2	57.0	C. K.	6	N. W.	17	30.037	62.4	49.9	Clear	0	N. E.	4	
6	29.618	67.4	53.9	C. K.	4	N. W.	9	30.074	54.0	45.4	Clear	0	E.	6	
9	29.674	60.4	46.4	C. S.	1	N. W.	15	30.134	46.9	40.9	Clear	0	E.	0	
Means	29.550	61.2	52.2	. .	6.6	. .	7.6	29.988	53.2	46.1	. .	2.1	. .	4.8	

APRIL 4								APRIL 5							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30. 182	42. 9	40. 8	Clear	0	S.	5	30. 301	45. 4	42. 9	C. K.	1	S. E.	5	
3	30. 213	40. 4	38. 9	C. K.	6	S.	3	30. 265	44. 9	42. 4	C. K.	10	S. E.	5	
6	30. 249	40. 9	38. 9	C. K.	10	E.	4	30. 257	45. 9	44. 9	N.	10	S. E.	4	
9	30. 285	47. 9	43. 4	C. K.	6	S., S. E.	5	30. 178	49. 4	48. 9	N.	10	S. E.	4	
12	30. 288	58. 9	50. 4	Clear	0	S.	9	30. 058	52. 9	52. 4	K.	10	S.	3	
3	30. 243	62. 9	54. 4	C.	6	S.	7	29. 925	57. 4	56. 4	C. K.	10	S.	3	
6	30. 251	59. 9	51. 9	C. K.	4	E.	5	29. 854	63. 4	61. 4	C. K.	10	S.	3	
9	30. 292	48. 4	44. 4	C. K.	3	S. E.	7	29. 798	66. 4	62. 4	Haze	0	S.	11	
Means	30. 250	50. 3	45. 4	. .	4. 4	. .	5. 6	30. 080	53. 2	51. 5	. .	7. 6	. .	4. 8	
APRIL 6								APRIL 7							
0	29. 741	67. 4	64. 4	K.	10	S.	12	30. 121	49. 4	42. 6	Clear	0	N. W.	2	
3	29. 795	65. 4	63. 9	N.	10	N.	11	30. 120	51. 0	45. 4	Clear	0	N. W.	4	
6	29. 838	62. 4	61. 4	C. K.	10	N. W.	4	30. 163	49. 9	42. 9	C. K.	9	N. W.	4	
9	29. 906	65. 9	60. 9	C. K.	7	N. W.	9	30. 157	54. 9	45. 4	C. K.	2	N. W.	6	
12	30. 027	65. 4	52. 9	C. K.	4	N. W.	17	30. 098	62. 4	50. 4	C. K.	3	N. W.	10	
3	30. 040	64. 9	52. 9	C. K.	6	N. W.	11	30. 038	61. 9	49. 4	C. K.	9	N. W.	12	
6	30. 066	63. 4	49. 9	C. K.	4	N. W.	8	30. 046	59. 9	48. 9	C. K.	3	N. W.	12	
9	30. 103	55. 9	46. 9	Clear	0	N. W.	1	30. 095	51. 4	44. 9	C. K.	4	N. W.	4	
Means	29. 940	63. 8	56. 6	. .	6. 4	. .	9. 1	30. 105	55. 1	46. 2	. .	3. 8	. .	6. 8	
APRIL 8								APRIL 9							
0	30. 130	47. 9	40. 9	C. K.	2	N. W.	5	30. 299	37. 4	35. 9	Clear	0	N. W.	1	
3	30. 205	39. 9	32. 9	C. K.	1	N. W.	12	30. 329	34. 4	33. 4	Clear	0	N. E.	2	
6	30. 263	34. 4	30. 4	C. K.	1	N. W.	6	30. 374	32. 4	31. 9	Clear	0	N. E.	3	
9	30. 324	40. 9	33. 9	Clear	0	N.	8	30. 412	47. 4	41. 9	Clear	0	S. E.	6	
12	30. 295	46. 9	38. 2	Clear	0	N.	7	30. 374	55. 4	47. 4	Clear	0	S. E.	5	
3	30. 235	53. 9	43. 9	Clear	0	N. W.	5	30. 311	57. 9	47. 9	C. K.	4	S. E.	10	
6	30. 227	50. 4	41. 4	Clear	0	N. W.	4	30. 309	52. 6	46. 2	C. K.	9	S. E.	12	
9	30. 269	41. 4	37. 4	Clear	0	N. W.	2	30. 321	46. 2	41. 6	C. K.	7	S. E.	9	
Means	30. 244	44. 5	37. 4	. .	0. 5	. .	6. 1	30. 341	45. 5	40. 8	. .	2. 5	. .	6. 0	
APRIL 10								APRIL 11							
0	30. 295	45. 4	41. 4	C. K.	10	S. E.	8	29. 856	59. 2	58. 4	C. K.	8	S. W.	5	
3	30. 225	43. 9	41. 9	N.	10	S. E.	7	29. 896	53. 4	48. 4	C. K.	2	W.	8	
6	30. 183	43. 9	42. 4	N.	10	S. E.	7	29. 862	49. 9	45. 9	C. K.	2	W.	4	
9	30. 115	47. 4	46. 4	N.	10	S., S. E.	11	29. 940	56. 4	47. 9	C. K.	2	N. W.	16	
12	30. 039	51. 9	50. 9	N.	10	S.	12	29. 992	58. 4	49. 4	C. K.	6	N. W.	12	
3	29. 928	53. 9	53. 4	N.	10	S.	6	29. 990	63. 4	50. 9	C.	1	N. W.	9	
6	29. 855	56. 4	55. 4	K.	10	S.	8	30. 032	57. 4	51. 4	C.	1	N. W.	3	
9	29. 838	58. 9	57. 9	C. K.	9	S. W.	8	30. 066	47. 4	44. 4	Clear	0	N. W.	2	
Means	30. 060	50. 2	48. 7	. .	9. 9	. .	8. 4	29. 954	55. 7	49. 6	. .	2. 8	. .	7. 4	

APRIL 12								APRIL 13							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.075	44.4	40.4	Clear	0	N. W.	2	30.239	38.4	32.9	Clear	0	N. W.	12	
3	30.053	41.9	39.9	Clear	0	N. W.	2	30.228	33.9	28.9	Clear	0	N. W.	7	
6	30.056	40.4	39.4	C. K.	6	S.	2	30.256	31.6	28.4	Clear	0	N. W.	7	
9	30.051	59.9	49.9	C. K.	1	S. W.	8	30.299	38.4	30.9	Clear	0	N. W.	10	
12	29.967	63.9	50.9	C. K.	8	S. W.	6	30.245	46.9	37.9	Clear	0	N., N. W.	7	
3	30.012	54.4	45.9	C. K.	8	N. W.	12	30.183	51.4	41.4	C. K.	8	N. W.	4	
6	30.062	53.9	51.8	C. K.	3	N. W.	13	30.155	48.9	40.9	C. K.	2	S. W.	3	
9	30.192	45.4	37.9	Clear	0	N. W.	12	30.108	40.9	37.4	Clear	0	S.	6	
Means	30.058	50.5	44.5	. .	3.2	. .	7.1	30.214	41.3	34.8	. .	1.2	. .	7.0	
APRIL 14								APRIL 15							
0	30.049	40.4	37.4	C. K.	6	S.	5	29.922	43.4	36.4	Clear	0	N. W.	15	
3	29.951	42.4	37.9	C. K.	10	S.	5	29.962	39.4	34.4	Clear	0	N. W.	6	
6	29.839	42.9	37.9	C. K.	8	S., S. W.	9	30.013	38.4	34.4	C. K.	1	W.	5	
9	29.802	47.4	41.6	C. K.	10	N. W.	2	30.015	45.9	39.4	C. K.	4	N. W.	7	
12	29.723	63.2	51.4	C. K.	6	N. W.	8	29.987	53.4	45.4	C. K.	4	N. W.	6	
3	29.712	62.2	48.2	C. K.	7	N. W.	15	29.913	54.4	45.4	C. K.	6	N. W.	5	
6	29.788	56.4	46.9	Clear	0	N. W.	18	29.843	52.9	45.2	C. K.	10	S. E.	4	
9	29.883	46.4	40.4	Clear	0	N. W.	18	29.836	46.4	41.4	N.	10	S. E.	7	
Means	29.843	50.2	42.7	. .	5.9	. .	10.0	29.936	46.8	40.2	. .	4.4	. .	6.9	
APRIL 16								APRIL 17							
0	29.745	44.0	42.9	C. K.	9	S. E.	7	30.110	40.9	38.4	Clear	0	N. W.	6	
3	29.615	44.4	43.4	C. K.	10	S. E.	7	30.185	36.9	34.9	C. K.	2	N. W.	6	
6	29.667	43.9	42.4	K.	10	N.	5	30.259	33.9	32.9	C. K.	2	N. W.	4	
9	29.817	42.4	41.9	C. K.	10	N.	7	30.290	46.4	38.9	Clear	0	N. W.	7	
12	29.947	43.9	41.4	C. K.	10	N. W.	5	30.277	53.9	44.4	C. K.	1	S.	3	
3	29.983	49.9	44.9	C. K.	8	N. W.	7	30.219	59.2	47.4	C. K.	5	E.	5	
6	30.017	52.4	44.4	C. K.	3	N. W.	6	30.201	53.4	47.4	C. K. S.	8	S.	3	
9	30.063	43.9	40.9	Clear	0	N. W.	3	30.206	47.4	41.9	C. K.	9	S.	6	
Means	29.857	45.6	42.8	. .	7.5	. .	5.9	30.218	46.5	40.8	. .	3.4	. .	5.0	
APRIL 18								APRIL 19							
0	30.173	45.4	40.4	C. S.	1	S. W.	5	30.008	52.9	45.4	C. K.	10	N. W.	3	
3	30.135	40.9	37.9	C. S.	2	S. W.	4	30.010	47.9	42.4	C. K.	8	N. W.	2	
6	30.089	41.4	39.4	Clear	0	S., S. W.	5	30.014	45.0	42.9	C. K.	10	N. W.	2	
9	30.025	50.9	46.4	C. K.	8	S., S. W.	7	29.999	51.9	46.4	C. K.	10	W.	2	
12	29.979	62.4	55.4	C. K.	10	S., S. W.	5	29.939	58.4	48.4	C. K.	10	S.	3	
3	29.893	71.4	61.4	C. K.	5	N. W.	3	29.906	55.9	47.9	C. K.	10	S.	6	
6	29.914	60.0	52.4	C. K.	10	N. W.	11	29.876	51.4	46.9	C. K.	4	S., S. W.	3	
9	29.936	55.8	45.9	C. K.	10	N. W.	7	29.869	44.9	43.9	C. K.	4	S.	2	
Means	30.018	53.5	47.4	. .	5.8	. .	5.9	29.953	51.0	45.5	. .	8.2	. .	2.9	

APRIL 20								APRIL 21							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.837	44.9	43.9	C. K.	9	S.	3	29.976	37.4	33.9	Clear	0	N. W.	6	
3	29.761	44.4	43.4	C. K.	10	S. W.	2	29.962	35.4	33.4	Clear	0	N. W.	4	
6	29.797	45.4	43.9	C. K.	9	W., N. W.	2	29.980	34.4	32.4	Clear	0	N. W.	3	
9	29.837	48.4	40.9	C. K.	9	N. W.	17	30.008	43.9	36.4	C. K.	3	N. W.	16	
12	29.847	51.9	41.2	C. K.	5	N. W.	14	30.001	48.9	39.4	C. K.	6	N. W.	11	
3	29.849	53.4	41.8	C. K.	7	N. W.	13	29.950	47.4	38.9	C. K.	7	N. W.	12	
6	29.899	47.4	38.4	C. K.	1	N. W.	11	29.948	47.9	38.9	C. K.	7	N. W.	8	
9	29.962	41.4	36.9	Clear	0	N. W.	9	29.985	41.4	37.2	C. K.	9	N. W.	1	
Means	29.849	47.2	41.3	. .	6.2	. .	8.9	29.976	42.1	36.3	. .	4.0	. .	7.6	
APRIL 22								APRIL 23							
0	29.996	40.8	38.6	N.	10	N. W.	10	29.795	46.4	45.9	N.	10	E.	2	
3	29.973	39.9	37.7	C. K.	10	N. W.	3	29.701	45.4	44.9	N.	10	N. E.	5	
6	29.983	40.9	38.9	N.	10	N. W.	1	29.741	43.9	43.4	N.	10	N.	7	
9	29.996	43.4	38.4	C. K.	10	W.	3	79.815	42.9	41.8	N.	10	N.	7	
12	29.938	54.4	47.4	C. K.	7	N. W.	4	29.837	51.9	44.6	C. K.	3	N. W.	11	
3	29.851	54.4	47.4	C. K.	10	N. W.	2	29.849	56.9	46.9	C. K.	7	N. W.	9	
6	29.851	52.4	47.4	N.	10	S. W.	2	29.906	51.4	46.4	C. K.	10	N. W.	8	
9	29.860	47.9	46.9	N.	10	S. E.	2	29.978	46.4	43.4	C. K.	4	N. W.	8	
Means	29.931	46.8	42.8	. .	9.6	. .	3.4	29.828	48.2	44.7	. .	8.0	. .	7.1	
APRIL 24								APRIL 25							
0	30.020	40.9	37.4	Clear	0	N. W.	4	30.377	39.9	34.4	Clear	0	N.	8	
3	30.036	37.9	34.4	Clear	0	N. W.	4	30.409	34.0	31.4	Clear	0	N.	2	
6	30.091	36.4	32.4	S.	1	N. W.	6	30.470	32.9	29.9	Clear	0	N. W.	3	
9	30.144	44.4	37.9	C. K.	3	N. W.	9	30.514	45.4	37.4	Clear	0	N., N. E.	7	
12	30.174	49.9	41.4	C. K.	6	N. W.	9	30.494	52.0	43.2	Clear	0	N. W.	4	
3	30.187	52.9	42.4	C. K.	6	N. W.	10	30.447	55.9	45.6	Clear	0	S. W.	3	
6	30.231	48.9	39.9	C. K.	3	N. W.	3	30.421	53.7	44.4	Clear	0	S.	3	
9	30.305	43.4	37.9	Clear	0	N. W.	4	30.467	44.4	40.4	Clear	0	S., S. E.	3	
Means	30.148	44.3	38.0	.	2.4	. .	6.1	30.450	44.8	38.3	. .	0.0	. .	4.1	
APRIL 26								APRIL 27							
0	30.472	40.4	36.9	Clear	0	S.	2	30.369	49.9	45.4	Clear	0	S.	1	
3	30.478	38.4	36.4	Clear	0	S.	2	30.335	45.9	43.4	Clear	0	S.	1	
6	30.490	35.4	33.9	C.	7	S. W.	2	30.358	42.9	41.4	C. K.	2	S.	1	
9	30.500	54.3	46.2	C. K.	3	S. W.	4	30.353	58.9	51.4	Clear	0	N. W.	1	
12	30.467	64.4	53.9	Clear	0	S. E.	7	30.329	75.2	59.9	Clear	0	S. E.	3	
3	30.396	68.0	54.7	C. K.	2	S.	8	30.251	79.6	61.9	C. K.	3	S.	3	
6	30.371	64.2	52.4	C. K.	7	S.	5	30.235	73.9	58.9	Clear	0	E.	4	
9	30.389	55.0	47.9	C. K.	3	S.	1	30.251	63.9	52.4	Clear	0	E.	2	
Means	30.445	52.5	45.3	. .	2.8	. .	3.9	30.310	61.3	51.8	. .	0.6	. .	2.0	

APRIL 28								APRIL 29							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.268	55.4	50.4	Clear	0	E.	2	30.036	57.4	54.9	C. K.	2	N. W.	2	
3	30.246	48.4	45.4	Clear	0	N. E.	2	29.998	54.4	51.9	C. K.	2	N. W.	3	
6	30.250	46.4	44.9	Clear	0	N.	2	29.974	53.9	51.9	C. K.	.	N. W.	1	
9	30.228	59.9	53.4	Clear	0	N. W.	2	29.980	69.9	60.9	Clear	0	W., N. W.	2	
12	30.181	75.4	62.4	Clear	0	S. W.	2	29.937	82.9	73.9	Clear	0	N. W.	5	
3	30.098	81.4	64.9	Clear	0	S. W.	2	29.879	86.4	75.4	Clear	0	N. W.	4	
6	30.077	76.3	61.8	C. K.	5	S. E.	7	29.843	81.9	64.9	Clear	0	N. W.	1	
9	30.056	65.4	57.6	C. K.	2	S. E.	1	29.862	71.9	62.4	S.	1	W.	1	
Means	30.176	63.6	55.1	. .	0.9		2.5	29.939	69.8	62.0	. .	0.7	. .	2.4	
APRIL 30								MAY 1							
0	29.865	63.4	56.4	C. K.	4	S., S. E.	1	29.634	69.4	59.9	C. K.	10	S. W.	8	
3	29.834	57.9	55.4	C. K.	9	W., N. W.	2	29.624	63.9	59.4	C. K.	10	N. W.	1	
6	29.840	56.9	55.4	C. K.	10	W., N. W.	2	29.634	61.4	58.9	C. K.	10	S. E.	1	
9	29.836	69.4	62.9	Haze	9	S. E.	1	29.701	64.9	61.4	S.	10	S.	1	
12	29.784	81.4	67.9	Haze	9	S. E.	3	29.709	60.4	57.9	C. K.	10	N.	3	
3	29.642	85.4	68.4	Haze	9	S.	4	29.702	69.4	58.4	C. K.	5	N. W.	7	
6	29.592	79.4	62.4	Haze	10	S. W.	3	29.745	61.4	52.4	C. K.	3	N. W.	11	
9	29.590	72.9	59.9	C. K.	8	S. W.	2	29.808	53.4	47.9	C. K.	3	N. W.	7	
Means	29.748	70.8	61.1	.	8.5	. .	2.2	29.695	63.0	57.0	. .	7.6	. .	4.9	
MAY 2								MAY 3							
0	29.842	50.6	44.8	C. K.	7	N. W.	8	30.116	43.9	41.4	Clear	0	N.	1	
3	29.851	45.9	41.2	C. K.	2	N. W.	7	30.136	39.9	38.4	Clear	0	N.	2	
6	29.900	44.4	40.9	C. K.	2	N. W.	4	30.178	38.4	37.4	Clear	0	N. W.	2	
9	29.987	49.9	44.4	C. K.	8	N. W.	11	30.206	54.4	47.4	C. K.	4	S. E.	4	
12	30.001	54.9	46.4	C. K.	2	N. W.	13	30.159	60.9	51.3	C. K.	3	S.	5	
3	30.007	59.9	49.9	C. K.	2	N. W.	11	30.113	64.6	53.9	C. K.	3	S.	7	
6	30.030	55.4	45.4	C. K.	1	N.	7	30.084	60.4	50.4	C. K.	2	S., S. E.	6	
9	30.081	49.4	43.9	Clear	0	N., N. E.	6	30.133	50.9	47.4	C. K.	2	S. E.	8	
Means	29.962	51.3	44.6	. .	3.0	. .	8.4	30.141	51.7	46.0	. .	1.8	. .	4.4	
MAY 4								MAY 5							
0	30.122	50.4	46.4	C. K.	10	S. E.	7	29.934	61.4	59.4	C. K.	8	S. W.	5	
3	30.104	49.9	46.4	C. K.	10	S. E.	7	29.912	59.7	57.9	C. K.	3	S. W.	3	
6	30.110	49.9	46.9	C. K.	8	S.	6	29.940	60.4	58.9	C. K.	10	S.	3	
9	30.106	54.9	50.9	C. K.	10	S.	5	29.955	66.4	63.4	C. K.	8	S. W.	3	
12	30.032	66.4	60.4	C. K.	6	S., S. E.	6	29.945	73.9	67.4	C. K.	6	S. E.	5	
3	29.950	72.9	62.9	C. K.	6	S.	9	29.918	78.9	68.4	C. K.	4	S. E.	4	
6	29.886	70.9	62.9	C. K.	9	S.	5	29.940	73.9	59.9	Clear	0	N.	7	
9	29.932	62.9	60.4	N.	10	S.	4	30.022	63.9	54.4	Clear	0	N. W.	2	
Means	30.030	59.8	54.6	. .	8.6	. .	6.1	29.946	67.3	61.2	. .	4.9	. .	4.0	

MAY 6								MAY 7							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.089	56.4	53.4	Clear	0	N. W.	3	30.119	59.4	56.4	Clear	0	W.	1	
3	30.086	50.9	48.4	Clear	0	N. W.	3	30.123	53.9	52.4	C. K.	3	N. W.	2	
6	30.130	49.4	47.9	Clear	0	N. W.	2	30.166	54.4	51.9	C. K.	3	N. W.	2	
9	30.201	67.4	57.4	C. K.	4	W.	1	30.187	71.4	58.4	C.	3	E.	6	
12	30.175	75.9	60.4	C. K.	4	N. W.	3	30.160	76.9	59.9	C. K.	10	S. E.	7	
3	30.104	78.9	63.9	C. K.	6	S. E.	5	30.081	80.4	63.9	C. K.	3	E.	6	
6	30.069	74.4	61.4	C. K.	4	S.	4	30.077	74.9	61.4	C. K.	8	E.	8	
9	30.100	65.9	57.4	Clear	0	S.	3	30.121	66.4	57.9	C. K.	10	E.	5	
Means	30.119	64.9	56.3	. .	2.2	. .	3.0	30.129	67.2	57.8	. .	5.0	. .	4.6	
MAY 8								MAY 9							
0	30.128	63.9	55.4	C. K.	9	E.	4	29.957	60.9	59.9	N.	10	S. E.	1	
3	30.105	61.4	53.9	C. K.	10	E.	2	29.918	60.4	58.9	C.	2	N. E.	2	
6	30.112	59.9	53.9	C. K.	10	E.	4	29.928	61.4	60.4	C. K.	10	S.	1	
9	30.150	60.9	55.9	C. K.	10	N. E.	4	29.896	68.4	65.4	C. K.	9	S.	5	
12	30.145	62.9	58.4	C. K.	10	E.	4	29.874	75.2	69.4	C. K.	9	S.	4	
3	30.039	68.4	62.9	C. K.	10	E.	6	29.812	76.9	69.4	C. K.	9	S.	4	
6	29.982	70.4	63.9	C. K.	9	E.	5	29.809	73.9	66.4	C. K.	10	S. W.	3	
9	29.978	64.4	60.9	C. K.	10	E.	3	29.832	69.4	65.9	C. K.	10	S. W.	2	
Means	30.080	64.0	58.2	. .	9.8	. .	4.0	29.878	68.3	64.5	. .	8.6	. .	2.8	
MAY 10								MAY 11							
0	29.842	66.4	64.4	C. K.	10	S. W.	2	29.878	65.4	64.4	C. K.	10	S. E.	2	
3	29.800	65.9	64.4	C. K.	9	S. W.	3	29.858	64.4	63.4	C. K.	10	S. E.	3	
6	29.824	65.4	63.9	C. K.	10	S. W.	4	29.850	64.4	63.4	N.	10	E.	3	
9	29.858	66.9	64.9	C. K.	10	S.	4	29.830	64.9	64.4	N.	10	E.	6	
12	29.854	73.9	68.4	C. K.	9	S.	6	24.792	67.4	65.4	K.	10	E.	7	
3	29.831	73.9	69.4	C. K.	10	S.	5	29.733	69.4	67.9	N.	10	N. E.	8	
6	29.829	73.9	69.4	C. K.	10	S.	1	29.689	68.4	66.9	K.	10	N. E.	3	
9	29.877	69.4	64.9	N.	10	S. E.	4	29.714	67.4	66.4	K.	10	N.	2	
Means	29.839	69.5	66.2	. .	9.8	. .	3.6	29.793	66.5	65.3	. .	10.0	. .	4.2	
MAY 12								MAY 13							
0	29.712	66.9	65.9	K.	10	N. W.	1	29.750	63.9	63.4	C. K.	9	N. W.	1	
3	29.672	65.4	64.9	C. K.	10	N.	1	29.756	60.9	57.9	C. K.	9	N. W.	7	
6	29.668	66.4	65.9	N.	10	S.	1	29.817	58.9	53.9	C. K.	9	N. W.	6	
9	29.667	69.4	68.4	C. K.	10	S.	2	29.839	59.9	54.9	N.	10	N. E.	3	
12	29.624	75.4	70.9	C. K.	8	S.	3	29.812	69.4	62.4	C. K.	4	S. E.	4	
3	29.586	81.9	73.4	C. K.	4	S.	5	29.754	72.9	61.9	C. K.	6	S., S. W.	3	
6	29.632	65.9	64.9	N.	10	S.	2	29.728	66.9	57.9	C. K.	2	S. E.	3	
9	29.722	64.9	63.9	N.	10	N. W.	1	29.838	56.4	52.4	N.	10	N. W.	8	
Means	29.660	69.5	67.3	. .	9.0	. .	2.0	29.794	63.6	58.1	. .	7.4	. .	4.4	

MAY 14								MAY 15							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.775	51.9	50.9	Clear	0	N. W.	1	29.841	47.4	44.9	Clear	0	N. W.	6	
3	29.749	50.6	49.9	Clear	0	N. W.	1	29.867	44.9	42.9	C. K.	2	N. W.	6	
6	29.738	49.9	49.4	C. K.	10	N. W.	0	29.911	45.4	43.4	C. K.	9	N. W.	6	
9	29.743	59.4	56.4	C. K.	10	S.	2	29.938	49.2	43.0	C. K.	4	N. W.	9	
12	29.750	58.9	53.4	C. K.	10	N., N. W.	4	29.952	53.1	45.0	C. K.	9	N. W.	8	
3	29.731	64.9	56.9	C. K.	3	W., N. W.	4	29.930	55.4	46.6	C. K.	9	N. W.	6	
6	29.745	58.9	54.9	C. K.	9	N. W.	2	29.932	54.9	46.9	C. K.	7	N. W.	4	
9	29.837	49.9	48.4	C. K.	9	N. W.	5	29.943	50.9	45.9	C. K.	10	N.	2	
Means	29.758	55.6	52.5	. .	6.4	. .	2.4	29.914	50.2	44.8	. .	6.2	. .	5.9	
MAY 16								MAY 17							
0	29.967	50.9	47.4	C. K.	10	N. W.	2	29.972	49.0	46.9	Clear	0	N. W.	3	
3	29.935	49.4	45.9	N.	10	S. E.	2	30.030	44.4	41.9	Clear	0	N. W.	2	
6	29.863	47.4	45.9	N.	10	S. E.	4	30.074	42.9	42.4	C. K.	8	N. W.	1	
9	29.822	52.9	51.9	C. K.	8	S.	4	30.117	55.9	48.4	C. K.	4	N. W.	3	
12	29.801	59.9	54.4	C. K.	9	N. W.	3	30.076	61.9	51.4	C. K.	4	N. W.	3	
3	29.799	61.9	54.4	C. K.	8	N. W.	4	30.059	62.9	51.9	C. K.	8	N. W.	4	
6	29.848	59.4	53.0	C. K.	9	N. W.	5	30.045	60.9	53.4	C. K.	10	S., S. E.	3	
9	29.910	54.0	48.9	C. K.	7	N. W.	2	30.064	54.9	50.4	C. K.	7	S.	3	
Means	29.868	54.5	50.2	. .	8.9	. .	3.2	30.055	54.1	48.3	. .	5.1	. .	2.8	
MAY 18								MAY 19							
0	30.043	53.9	50.9	K.	10	N. E.	3	29.733	57.4	56.4	C. K.	10	N. W.	3	
3	30.023	52.4	50.9	K.	10	S. E.	2	29.737	57.8	56.4	C. K.	10	N. W.	4	
6	30.000	52.4	51.4	N.	10	N. E.	5	29.797	57.9	56.9	C. K.	10	W.	0	
9	29.975	52.6	51.4	C. K.	10	S. E.	6	29.868	63.9	61.9	K.	10	N. W.	1	
12	29.908	53.9	53.4	K.	10	S., S. E.	6	29.891	67.9	61.9	K.	10	N. W.	8	
3	29.831	56.9	56.2	K.	10	S., S. E.	4	29.907	66.4	58.4	K.	10	N. W.	6	
6	29.747	60.9	59.2	C. K.	10	S. E.	3	29.957	63.4	56.9	C. K.	10	N., N. W.	4	
9	29.723	57.9	57.4	C. K.	4	E.	3	30.014	58.9	53.4	C. K.	10	N.	4	
Means	29.906	55.1	53.8	. .	9.2	. .	4.0	29.863	61.7	57.8	. .	10.0	. .	3.8	
MAY 20								MAY 21							
0	30.058	52.4	48.4	C. K.	5	N., N. W.	2	30.114	48.4	47.4	C. K.	2	N. W.	2	
3	30.082	50.9	47.9	C. K. S.	4	N. W.	4	30.126	48.9	45.4	C. K.	2	N. W.	4	
6	30.126	50.4	45.4	C. K.	10	N. W.	3	30.156	48.8	44.9	C. K.	9	E.	1	
9	30.143	56.4	49.4	C. K.	10	N., N. E.	5	30.180	59.9	50.9	C. K.	7	S. E.	7	
12	30.116	62.4	54.2	C. K.	9	N. W.	3	30.156	65.4	54.9	C. K.	4	S. E.	5	
3	30.083	66.4	55.4	C. K.	9	N., N. W.	4	30.115	65.9	55.4	C. K.	9	S. E.	5	
6	30.078	61.4	52.9	C. K.	7	N., N. E.	2	30.083	61.4	53.4	C. K.	10	S. E.	4	
9	30.110	54.2	49.6	C. K.	2	S. E.	2	30.108	56.4	52.9	C. K.	10	S., S. E.	4	
Means	30.100	56.8	50.4	. .	7.0	. .	3.1	30.130	56.9	50.6	. .	6.6	. .	4.0	

MAY 22								MAY 23							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.098	52.4	50.4	C. K.	10	S. E.	3	29.936	57.9	53.9	C. K.	10	N. E.	7	
3	30.079	50.9	47.4	C. K.	10	S. E.	1	29.888	55.4	53.9	N.	10	N. E.	7	
6	30.098	51.4	46.9	C. K. S.	10	N. E.	4	29.848	53.9	52.9	N.	10	N. E.	11	
9	30.065	62.4	53.0	C. K.	9	E.	7	29.849	58.4	57.4	N.	10	N. E.	8	
12	30.073	65.6	55.4	C. K.	9	E.	7	29.817	61.9	60.9	N.	10	E., S. E.	8	
3	30.017	65.8	55.4	C. K.	10	E.	6	29.797	61.4	60.9	N.	10	E., S. E.	7	
6	29.992	62.9	55.9	C. K.	10	N. E.	9	29.770	61.9	60.9	C. K.	10	E.	7	
9	29.984	59.4	54.9	C. K.	10	N. E.	6	29.801	60.4	58.9	C. K.	10	E.	4	
Means	30.051	58.8	52.4	. .	9.8	. .	5.4	29.838	58.9	57.5	. .	10.0	. .	7.4	
MAY 24								MAY 25							
0	29.801	59.4	58.4	C. K.	10	E.	3	29.830	59.4	58.4	K.	10	N.	2	
3	29.765	58.9	58.0	N.	10	E., N. E.	4	29.824	57.4	56.4	K.	10	N.	0	
6	29.785	57.9	57.4	N.	10	E.	4	29.854	59.9	58.9	C. K.	10	N., N. W.	0	
9	29.801	60.9	58.9	K.	10	N. E.	4	29.843	60.9	59.9	C. K.	10	S. E.	1	
12	29.817	61.4	60.4	N.	10	N. E.	4	29.834	67.0	62.4	C. K.	10	S. E.	2	
3	29.790	62.4	61.4	N.	10	N. E.	5	29.810	65.7	62.4	C. K.	10	S. E.	5	
6	29.794	60.9	60.4	N.	10	N. E.	2	29.822	62.4	59.9	K.	10	E.	5	
9	29.834	59.9	58.9	K.	10	N. W.	2	29.826	61.4	59.4	K.	10	E.	5	
Means	29.798	60.2	59.2	. .	10.0	. .	3.5	29.830	61.8	59.7	. .	10.0	. .	2.5	
MAY 26								MAY 27							
0	29.822	58.9	57.9	K.	10	E., S. E.	5	29.852	61.0	60.0	C. K.	4	E.	0	
3	29.793	58.4	57.4	N.	10	E.	4	29.820	60.4	59.4	C. K.	10	S. W.	1	
6	29.826	57.9	56.9	K.	10	E.	3	29.848	60.6	59.9	Fog	10	S. E.	1	
9	29.843	59.9	57.9	C. K.	10	S. E.	1	29.862	62.9	61.9	C. K.	10	S. E.	1	
12	29.848	64.4	61.2	C. K.	10	S. E.	2	29.837	70.9	66.4	C. K.	4	S. E.	3	
3	29.808	70.9	65.4	C. K.	4	S. E.	2	29.788	79.4	71.9	C. K.	2	S. E.	4	
6	29.794	67.0	64.9	C. K.	9	E.	2	29.773	73.4	69.4	C. K.	10	E., S. E.	6	
9	29.838	62.9	60.9	C. K.	7	S. E.	2	29.763	66.9	63.9	C. K.	10	E., S. E.	2	
Means	29.822	62.5	60.3	. .	8.8	. .	2.6	29.818	66.9	64.1	. .	7.5	. .	2.2	
MAY 28								MAY 29							
0	29.754	63.9	61.4	C. K.	9	S. E.	2	29.639	74.4	70.9	C. K.	6	S. W.	3	
3	29.731	62.4	60.9	C. K.	10	E., S. E.	2	29.642	68.9	67.9	C. K.	8	N. W.	3	
6	29.756	62.9	60.9	C. K.	10	E., S. E.	2	29.744	68.4	66.9	C. K.	8	N.	1	
9	29.739	65.9	63.9	C. K.	10	N. E.	1	29.790	81.4	64.4	C.	7	S. E.	4	
12	29.724	77.0	71.9	C. K.	2	S.	2	29.784	85.4	74.4	C. K.	4	S.	5	
3	29.658	85.9	75.6	C. K.	3	S., S. W.	4	29.751	87.9	75.4	C. K.	3	S.	5	
6	29.617	82.4	74.4	C. K.	4	S.	5	29.683	82.4	72.4	C. K.	3	S.	1	
9	29.634	76.9	71.4	C. K.	4	S.	3	29.782	74.4	69.0	C. K.	10	N. W.	4	
Means	29.702	72.2	67.6	. .	6.5	. .	2.6	29.727	77.9	70.2	. .	6.1	. .	3.2	

MAY 30								MAY 31							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.799	65.9	66.9	C. K.	10	N. W.	2	29.827	68.4	67.4	N.	10	N. E.	1	
3	29.841	66.9	66.4	N.	10	S.	1	29.798	65.4	64.4	K.	10	N.	1	
6	29.872	67.4	66.4	C. K.	10	S. W.	1	29.817	64.9	63.4	N.	10	S. E.	1	
9	29.887	70.4	68.9	C. K.	10	S.	1	29.789	63.9	62.9	N.	10	N. E.	1	
12	29.894	73.9	70.9	C. K.	10	S. E.	1	29.750	63.9	62.9	N.	10	N. E.	2	
3	29.863	77.9	71.4	C. K.	9	N., N. W.	1	29.692	65.4	62.9	C. K.	10	E.	5	
6	29.836	75.9	73.4	N.	10	E.	1	29.655	64.9	62.9	N.	10	N. E.	1	
9	29.849	69.4	68.4	K.	10	N. E.	1	29.647	63.4	62.4	N.	10	N. E.	1	
Means	29.855	71.0	69.1	. .	9.9	. .	1.1	29.747	65.0	63.6	. .	10.0	. .	1.6	
JUNE 1								JUNE 2							
0	29.607	62.9	62.4	C. K.	10	N. E.	1	29.745	56.4	55.0	Clear	0	N. W.	2	
3	29.567	61.9	60.9	C. K.	9	N. W.	1	29.745	52.4	51.0	C. K.	2	N. W.	2	
6	29.619	60.9	59.9	C. K.	3	N. W.	1	29.777	53.0	51.4	C. K.	4	N. W.	1	
9	29.683	68.4	62.9	C. K.	3	N. W.	9	29.821	66.9	58.9	C. K.	6	S. E.	2	
12	29.687	70.9	60.9	C. K.	1	N. W.	7	29.827	67.9	60.9	C. K.	10	S. W.	3	
3	29.695	73.9	61.9	C.	1	N. W.	8	29.781	70.9	61.9	C. K.	7	S. E.	2	
6	29.705	67.9	57.9	C. K.	2	N. W.	5	29.783	68.4	61.9	C. K.	10	S. E.	1	
9	29.737	60.4	55.9	Clear	0	N. W.	2	29.799	64.4	60.9	C. K.	9	S.	0	
Means	29.662	65.9	60.3	. .	3.6	. .	4.2	29.785	62.5	57.7	. .	6.0	. .	1.6	
JUNE 3								JUNE 4							
0	29.852	57.4	56.4	C. K.	9	S.	2	29.947	53.4	52.4	Clear	0	N. W.	3	
3	29.852	54.9	51.9	C. K.	10	N.	5	29.985	51.4	49.9	C. K.	2	N. W.	3	
6	29.912	51.9	49.4	C. K.	7	N.	5	30.034	50.9	49.9	Clear	0	N. W.	3	
9	29.936	62.9	56.4	C. K.	2	N.	5	30.082	64.9	55.4	Clear	0	N.	3	
12	29.912	66.9	57.4	C. K.	7	N.	5	30.071	70.9	59.4	C. K.	1	N. W.	4	
3	29.889	67.2	57.9	C. K.	7	N. W.	4	30.054	73.4	60.4	C. K.	3	N.	3	
6	29.896	63.9	54.9	C. K.	3	N., N. W.	4	30.060	68.4	58.4	C. K.	3	W.	2	
9	29.924	56.4	53.9	Clear	0	N. W.	3	30.095	59.9	56.9	Clear	0	W.	1	
Means	29.897	60.2	54.8	. .	5.6	. .	4.1	30.041	61.6	55.3	. .	1.1	. .	2.8	
JUNE 5								JUNE 6							
0	30.118	55.3	53.9	Clear	0	N. W.	1	30.108	64.4	60.9	Clear	0	S. W.	2	
3	30.141	52.4	51.9	Clear	0	N. W.	1	30.088	59.4	52.4	S.	1	S.	1	
6	30.176	52.4	51.9	Clear	0	N. W.	1	30.101	60.9	59.4	C. K.	1	S.	1	
9	30.192	70.4	63.9	C. K.	2	S. E.	3	30.106	75.2	68.4	C. K.	2	S.	3	
12	30.193	78.4	65.9	C. K.	1	S. E.	6	30.038	84.4	75.4	C. K.	2	S.	4	
3	30.138	81.4	68.4	Clear	0	S. E.	5	29.974	89.4	75.9	C. K.	3	S.	5	
6	30.110	74.4	62.4	C.	4	S.	4	29.944	81.4	71.9	C. K.	2	S. W.	4	
9	30.114	66.4	61.9	Clear	0	S. W.	2	29.930	73.9	67.9	Clear	0	S. W.	4	
Means	30.148	66.4	60.0	. .	0.9	. .	2.9	30.036	73.6	66.5	. .	1.4	. .	3.0	

JUNE 7								JUNE 8							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.901	71.4	66.9	C. K.	7	S. W.	3	30.006	58.4	54.4	Clear	0	N. W.	5	
3	29.877	67.9	65.9	C. K.	6	S. W.	2	30.012	53.9	51.4	Clear	0	N. W.	3	
6	29.923	66.9	65.4	C. K.	4	N. W.	2	30.032	54.9	52.6	Clear	0	N. W.	4	
9	29.970	75.9	66.4	C.	3	N. W.	4	30.065	65.4	59.9	C. K.	9	N.	3	
12	29.958	76.9	65.9	C. K.	7	N. W.	7	30.082	70.4	63.9	C. K.	10	N. W.	5	
3	29.926	78.9	67.4	C. K.	2	N. W.	7	30.055	72.4	64.9	C. K.	10	N. E.	3	
6	29.922	73.0	63.2	Clear	0	N.	6	30.043	71.4	64.4	C. K.	10	S. E.	4	
9	30.006	64.0	58.0	C. K.	2	N.	5	30.071	64.4	61.4	C.	1	S.	1	
Means	29.935	71.9	64.9	. .	3.9	. .	4.5	30.046	63.9	59.1	. .	5.0	. .	3.5	
JUNE 9								JUNE 10							
0	30.057	60.4	58.4	Clear	0	S.	1	29.910	66.4	64.4	C. K.	1	S.	5	
3	30.046	57.9	56.4	S.	1	S. W.	1	29.882	64.4	63.4	C. K.	3	S.	4	
6	30.065	59.4	58.4	C. K.	6	S. E.	1	29.878	64.9	63.9	Clear	0	S.	2	
9	30.072	72.4	66.9	C. K.	4	S. E.	4	29.872	74.4	70.9	C. K. N.	10	S.	2	
12	30.038	78.9	69.9	C. K.	4	S.	5	29.834	81.9	75.4	C. K.	7	S.	2	
3	29.969	81.4	70.9	Clear	0	S.	6	29.771	83.4	75.9	C. K.	7	S., S. W.	4	
6	29.943	75.4	67.9	Clear	0	S.	4	29.708	70.9	68.4	C. K.	10	S.	1	
9	29.930	68.4	64.9	Clear	0	S.	4	29.715	68.9	67.4	C. K.	10	S.	5	
Means	30.015	69.3	64.2	. .	1.9	. .	3.2	29.821	71.9	68.7	.	6.0	. .	3.1	
JUNE 11								JUNE 12							
0	29.676	67.4	66.4	C. K.	8	S.	1	29.944	60.4	55.4	C. K.	2	N. W.	8	
3	29.639	64.9	63.4	C. K.	7	S.	2	29.980	58.4	56.4	Clear	0	N. W.	5	
6	29.659	66.4	65.4	C. K.	9	S.	1	30.021	54.9	52.4	Clear	0	N., N. W.	5	
9	29.696	73.4	68.4	C.	10	W., N. W.	3	30.083	69.9	58.9	Clear	0	N. E.	3	
12	29.699	75.9	68.4	C. K.	8	N. W.	5	30.068	74.0	60.4	C. K.	2	E.	4	
3	29.707	79.9	67.4	C. K.	3	N. W.	10	30.043	76.4	61.9	C. K.	3	N. W.	5	
6	29.781	70.4	60.9	C. K.	1	N. W.	13	30.035	69.9	58.9	C. K.	1	S. E.	3	
9	29.890	63.9	56.9	C. K.	8	N. W.	10	30.067	61.9	56.9	Clear	0	S. W.	5	
Means	29.718	70.3	64.6	. .	6.8	. .	5.6	30.030	65.7	57.6	. .	1.0	. .	4.8	
JUNE 13								JUNE 14							
0	30.087	57.4	54.9	Clear	0	W.	2	30.001	62.0	58.9	C. K.	7	S.	2	
3	30.116	55.4	53.4	Clear	0	W.	1	29.966	60.9	57.9	C. K.	2	S.	2	
6	30.160	57.4	56.4	Clear	0	S. W.	1	29.982	62.4	60.9	C. K.	10	S.	1	
9	30.148	70.4	61.9	C. K.	3	S.	3	29.984	74.9	69.4	C. K.	4	S. W.	3	
12	30.123	76.4	64.9	C. K.	5	S.	5	29.957	83.9	75.9	C. K.	3	S.	5	
3	30.066	78.9	66.4	C. K.	4	S.	5	29.890	87.4	76.4	C. K.	4	S.	4	
6	30.050	71.9	63.9	C. K.	9	S.	4	29.891	73.9	71.4	C. K.	6	S.	7	
9	30.010	64.4	60.0	C. K.	3	S.	5	29.895	71.4	69.4	C. K. S.	3	S.	3	
Means	30.095	66.5	60.2	. .	3.0	. .	3.2	29.946	72.1	67.5	. .	4.9	. .	3.4	

JUNE 15								JUNE 16							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.886	67.4	65.9	Clear	0	S. W.	1	29.765	73.4	70.4	Clear	0	S. W.	1	
3	29.872	66.4	65.4	C. K. S.	3	N. W.	2	29.755	69.9	68.4	C. K.	3	S. W.	1	
6	29.890	66.4	64.9	C. K.	9	N. W.	2	29.777	68.9	67.9	C. K.	3	S. W.	1	
9	29.886	77.9	73.0	C. K.	9	S.	2	29.779	82.9	77.4	C. K.	9	W., N. W.	1	
12	29.865	87.9	77.9	C. K.	8	W.	1	29.857	89.9	77.9	C. K.	3	N. W.	3	
3	29.813	91.8	79.4	C. K.	7	S. W.	2	29.684	91.9	78.7	C. K.	4	S. W.	3	
6	29.768	84.9	75.9	C. K.	3	S. W.	3	29.665	83.9	75.4	C. K. N.	9	S. W.	2	
9	29.773	76.9	72.4	C. K.	2	S. W.	2	29.741	70.4	68.4	C. K.	1	S.	1	
Means	29.844	77.4	71.8	. .	5.1	. .	1.9	29.753	78.9	73.1	. .	4.0	. .	1.6	
JUNE 17								JUNE 18							
0	29.781	67.9	66.9	C. K.	4	S. W.	1	29.792	70.9	68.9	C. K.	6	S. W.	2	
3	29.777	67.4	66.9	C. S.	1	N. W.	2	29.789	70.4	68.4	C. K.	2	S. W.	1	
6	29.812	68.4	67.9	C. K.	4	N. W.	1	29.799	69.4	67.4	C. K.	1	N. W.	2	
9	29.824	80.8	72.4	C. K.	4	N., N. E.	1	29.766	82.4	73.9	C. K.	1	N., N. E.	2	
12	29.819	85.7	73.4	C. K.	1	N., N. W.	2	29.752	89.2	77.2	C. K.	2	S.	3	
3	29.797	89.9	73.4	C. K.	4	N., N. E.	3	29.715	91.2	78.2	C. K.	4	S. E.	3	
6	29.774	82.4	73.9	C. K.	5	S. E.	3	29.697	86.4	74.9	C. K.	4	S., S. E.	5	
9	29.790	75.9	70.9	C. K.	5	S. W.	4	29.728	78.4	73.4	Clear	0	S.	1	
Means	29.797	77.3	70.7	. .	3.5	. .	2.1	29.755	79.8	72.8	. .	2.5	. .	2.4	
JUNE 19								JUNE 20							
0	29.776	75.4	72.9	C. K.	2	N. W.	2	29.874	67.4	62.2	C. K.	8	E., N. E.	1	
3	29.801	72.4	71.4	C. K.	2	N. W.	2	29.873	61.4	58.4	C. K.	3	N.	2	
6	29.829	71.4	70.4	C. K.	3	N. W.	3	29.896	61.6	58.0	C. K.	3	N.	1	
9	29.859	80.9	70.9	Clear	0	N.	5	29.868	76.9	65.4	C. K.	6	N., N. W.	1	
12	29.887	83.4	71.4	C. K.	3	N., N. E.	8	29.833	85.4	72.9	C. K.	4	S.	3	
3	29.873	86.9	72.9	C. K.	2	N. E.	4	29.790	88.4	74.4	C. K.	3	S., S. E.	6	
6	29.856	81.4	68.0	C. K.	3	N. E.	4	29.745	82.9	74.9	C. K.	3	S. W.	3	
9	29.866	74.4	66.7	C. K.	4	E.	4	29.787	74.9	69.9	C. K.	2	S. W.	1	
Means	29.843	78.3	70.6	. .	2.4	. .	4.0	29.833	74.9	67.0	. .	4.0	. .	2.2	
JUNE 21								JUNE 22							
0	29.788	70.9	66.4	C. K.	6	S. W.	1	29.757	74.4	70.4	C. K.	10	N. W.	3	
3	29.771	68.9	65.9	C. K.	6	S. W.	2	29.750	71.9	70.4	C. K. S.	9	N. W.	1	
6	29.779	69.9	66.9	C. K.	4	S. W.	1	29.756	72.9	70.4	C. K. S.	8	N. W.	1	
9	29.777	83.9	74.0	C. K.	8	S.	3	29.794	83.9	75.4	C. K.	3	N. W.	2	
12	29.753	87.9	78.6	C. K.	7	S. E.	5	29.774	90.9	77.9	C. K.	2	N. W.	3	
3	29.705	92.4	80.4	C. K.	3	S.	6	29.731	90.4	79.4	C. K.	4	S. W.	2	
6	29.701	83.4	73.4	C. K.	10	N. W.	3	29.683	86.4	78.4	C. K.	7	S. W.	1	
9	29.760	77.4	72.9	K.	10	N.	4	29.707	80.0	73.9	C. K.	9	S. W.	1	
Means	29.754	79.3	72.3	. .	6.8	. .	3.1	29.744	81.4	74.5	. .	6.5	. .	1.8	

JUNE 23								JUNE 24							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.705	75.4	72.4	C. K.	3	S. W.	1	29.705	74.4	73.4	C. K.	9	N. W.	1	
3	29.681	72.9	70.9	C. K.	7	S. W.	1	29.688	73.4	72.4	C. K.	9	N. W.	1	
6	29.705	73.9	71.7	C. K.	6	S. W.	1	29.699	72.9	71.9	C. K.	7	N. W.	1	
9	29.706	84.9	78.4	C. K.	9	N. W.	2	29.711	83.4	78.9	C. K.	3	S., S. W.	1	
12	29.689	94.4	80.1	C. K.	6	S.	2	29.699	90.2	79.4	C. K.	6	S. E.	2	
3	29.655	92.4	79.9	C. K.	10	N. E.	3	29.643	94.4	81.4	C. K.	3	S.	3	
6	29.666	76.9	75.9	N.	10	N.	2	29.623	86.9	77.4	C. K.	8	W.	2	
9	29.703	75.4	73.9	K.	10	N. W.	1	29.642	80.4	74.9	C. K.	8	N. W.	3	
Means	29.689	80.8	75.4	. .	7.6	. .	1.6	29.676	82.0	76.2	. .	6.6	. .	1.8	
JUNE 25								JUNE 26							
0	29.681	77.4	73.4	C. K.	9	S. W.	2	29.702	74.4	70.6	C. K.	8	S.	1	
3	29.664	75.4	71.4	C. K.	6	N.	4	29.677	73.9	69.4	C. K.	9	S.	1	
6	29.717	72.9	67.9	C. K.	1	N., N. W.	3	29.693	73.9	70.9	C. K.	9	S. W.	0	
9	29.749	81.9	71.9	C. K.	3	N. W.	6	29.716	81.4	74.4	C. K.	9	S. W.	1	
12	29.762	87.4	70.9	C. K.	2	N. W.	6	29.730	81.9	72.4	C. K.	9	N. W.	5	
3	29.733	90.9	72.9	Clear	0	N. W.	4	29.729	86.9	71.4	C. K.	3	N. W.	5	
6	29.693	85.4	72.9	C. K.	1	W.	1	29.729	83.9	71.9	Clear	0	N. W.	2	
9	29.709	77.6	72.9	C. K.	9	W.	1	29.787	75.9	71.4	Clear	0	N. W.	2	
Means	29.714	81.1	71.8	. .	3.9	. .	3.4	29.720	79.0	71.6	. .	5.9	. .	2.1	
JUNE 27								JUNE 28							
0	29.820	70.4	67.9	C. K.	3	N. W.	2	29.912	68.4	67.4	N.	10	N. E.	3	
3	29.837	69.9	67.9	C. K.	10	N. W.	2	29.855	66.9	65.9	N.	10	N. E.	8	
6	29.863	69.4	66.9	C. K.	9	N. W.	2	29.809	66.4	65.9	N.	10	E.	11	
9	29.927	75.9	67.9	C. K.	10	E.	3	29.790	67.9	67.4	N.	10	N. E.	3	
12	29.932	77.0	70.9	C. K.	10	S. E.	2	29.772	72.4	70.9	N.	10	N. E.	5	
3	29.915	75.4	71.0	N.	10	E.	2	29.753	74.4	71.9	K.	10	N. E.	5	
6	29.906	74.9	72.4	N.	10	N. E.	1	29.778	68.4	66.9	K.	10	N. E.	8	
9	29.910	70.9	69.4	N.	10	N. E.	1	29.810	64.9	63.4	C. K.	10	N. E.	7	
Means	29.889	73.0	69.3	. .	9.0	. .	1.9	29.810	68.7	67.5	. .	10.0	. .	6.2	
JUNE 29								JUNE 30							
0	29.818	59.9	58.8	N.	10	N. E.	7	30.049	60.4	59.4	Mist	10	N.	2	
3	29.844	57.4	56.4	N.	10	N.	5	30.027	59.9	59.4	C. K.	10	N., N. W.	2	
6	29.863	56.4	55.9	N.	10	N. E.	5	30.023	60.9	59.9	C. K.	10	N. W.	1	
9	29.936	57.4	56.9	N.	10	N., N. W.	3	30.031	65.4	63.9	C. K.	9	N. W.	2	
12	29.984	59.4	57.9	N.	10	N. E.	3	29.999	66.4	64.4	C. K.	9	W.	3	
3	29.983	64.4	60.4	C. K.	10	N. E.	4	29.908	77.4	68.4	C. K.	6	N. W.	5	
6	29.992	62.4	59.9	C. K.	10	N. E.	4	29.854	75.9	70.4	C. K.	9	W.	1	
9	30.019	61.4	59.4	C. K.	10	N., N. W.	2	29.821	69.9	67.4	Clear	0	W., N. W.	2	
Means	29.930	59.8	58.2	. .	10.0	. .	4.1	29.964	67.0	64.2	. .	7.9	. .	2.2	

JULY 1								JULY 2							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.834	67.4	64.9	Clear	0	N. W.	2	29.972	59.0	57.4	Clear	0	N. W.	2	
3	29.805	66.4	65.4	C. K.	7	N. W.	2	29.986	57.0	55.4	Clear	0	N. W.	3	
6	29.809	67.4	66.4	C.	1	N. W.	2	30.031	57.9	55.9	Clear	0	N. W.	2	
9	29.832	75.9	67.9	C. K.	2	N. W.	6	30.062	71.9	62.4	C. K.	3	N.	2	
12	29.845	76.9	65.9	C. K.	2	N. W.	11	30.074	75.9	65.4	C. K.	4	N. W.	3	
3	29.882	77.4	63.4	C. K.	2	N. W.	8	30.066	78.4	65.9	C. K.	3	E.	2	
6	29.910	71.4	61.6	C. K.	1	N., N. E.	6	30.055	72.4	65.4	C. K.	3	S. E.	5	
9	29.957	63.8	57.9	Clear	0	N. W.	2	30.067	65.4	60.9	C. K.	2	S. E.	3	
Means	29.859	70.8	64.2	. .	1.9	. .	4.9	30.039	67.2	61.1	. .	1.9	. .	2.8	
JULY 3								JULY 4							
0	30.073	60.9	59.4	Clear	0	S. W.	1	30.096	63.4	61.4	Clear	0	N. W.	1	
3	30.084	58.4	57.4	Clear	0	W.	1	30.085	60.9	59.4	Clear	0	N. W.	1	
6	30.140	57.9	57.4	C. K.	2	S. W.	1	30.091	61.9	59.9	Clear	0	S.	1	
9	30.158	72.9	66.4	C. K.	4	S., S. W.	3	30.083	74.9	68.4	Clear	0	S. E.	3	
12	30.134	78.9	67.9	C. K.	2	S.	5	30.031	82.9	74.4	C. K.	1	S. W.	4	
3	30.101	80.6	67.4	C. K.	3	S.	5	29.960	86.9	77.4	C. K.	2	S. W.	4	
6	30.060	75.9	66.4	C. K.	1	S. E.	3	29.910	81.4	74.4	C. K.	3	S.	4	
9	30.081	66.9	63.4	Clear	0	W.	1	29.930	76.4	72.9	C. K.	9	S.	2	
Means	30.104	69.0	63.2	. .	1.5	. .	2.5	30.023	73.6	68.5	. .	1.9	. .	2.5	
JULY 5								JULY 6							
0	29.910	72.9	69.9	Clear	0	S.	2	29.872	70.9	70.4	C. K.	5	W.	3	
3	29.876	70.4	68.9	C. K.	3	W.	2	29.878	69.9	68.9	C. K.	4	N. W.	2	
6	29.884	70.6	69.4	C. K.	9	N. W.	1	29.935	68.4	66.4	C. K.	4	N. W.	5	
9	29.880	82.9	77.4	C. K.	2	S.	1	29.989	77.4	68.4	Clear	0	W.	4	
12	29.841	89.4	79.4	C. K.	2	N. W.	3	29.979	82.9	70.4	C. K.	2	N.	5	
3	29.799	81.4	76.4	C. N.	10	S. W.	2	29.968	87.0	71.4	Clear	0	N.	3	
6	29.809	73.4	71.9	K.	10	S. W.	3	20.955	81.4	71.4	C.	2	W.	2	
9	29.860	72.9	71.9	C. K.	5	S. W.	1	29.925	75.9	66.9	Clear	0	W.	1	
Means	29.857	76.7	73.2	. .	5.1	. .	1.9	29.938	76.7	69.3	. .	2.1	. .	3.1	
JULY 7								JULY 8							
0	29.960	69.4	66.4	Clear	0	N. W.	1	29.857	77.9	72.9	C. K.	10	N. W.	4	
3	29.933	67.9	65.4	C. K.	10	N.	2	29.880	71.4	64.4	C. K.	10	N. W.	4	
6	29.926	71.4	66.4	C. K.	4	S. W.	1	29.927	68.9	62.4	C. K.	9	N. W.	4	
9	29.922	82.9	76.4	C. K.	3	S. W.	3	29.980	76.4	67.4	C.	6	N.	4	
12	29.862	88.9	78.4	C. K.	6	S. W.	4	29.975	82.9	70.4	C. K.	6	W.	3	
3	29.809	91.4	77.9	C. K.	6	W., N. W.	5	29.924	82.4	70.9	C. K.	9	S. W.	2	
6	29.774	85.9	78.0	C. K.	9	W., N. W.	3	29.898	79.9	69.9	C. K.	9	S. W.	0	
9	29.818	81.9	74.9	C. K.	10	N. W.	4	29.906	73.6	68.9	C. K.	9	S. W.	0	
Means	29.876	80.0	73.0	. .	6.0	. .	2.9	29.918	76.7	68.4	. .	8.5	. .	2.6	

JULY 9								JULY 10							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.945	69.9	68.2	N.	10	N. W.	4	29.749	72.9	72.4	N.	10	N. W.	2	
3	29.906	69.4	67.9	N.	10	S. W.	2	29.759	69.9	69.4	N.	10	N. E.	3	
6	29.861	69.4	68.0	N.	10	S., S. E.	2	29.767	66.4	65.9	N.	10	N. E.	4	
9	29.845	73.4	72.4	C. K.	10	S., S. W.	1	29.804	65.7	64.9	N.	10	N. E.	4	
12	29.824	76.9	74.7	N.	10	W.	1	29.824	66.9	65.9	N.	10	N., N. E.	4	
3	29.786	79.9	75.2	C. K.	10	W., N. W.	3	29.804	67.4	65.9	C. K.	10	N. E.	3	
6	29.755	77.4	73.9	C. K.	10	W.	2	29.814	68.9	67.4	C. K.	10	N., N. E.	1	
9	29.739	75.4	73.9	N.	10	E.	2	29.830	66.9	65.4	C. K.	7	E.	0	
Means	29.833	74.0	71.8	. .	10.0	. .	2.1	29.794	68.1	67.2	. .	9.6	. .	2.5	
JULY 11								JULY 12							
0	29.814	64.8	64.0	C. K.	10	S. E.	1	29.659	72.9	69.4	C. K.	8	N. W.	5	
3	29.808	63.9	62.9	C. K.	10	W.	1	29.646	72.4	70.4	C. K.	7	N. W.	2	
6	29.824	63.4	62.9	C. K.	8	N. W.	0	29.645	74.9	71.4	C. K.	7	W.	4	
9	29.830	73.9	69.4	C. K.	4	N. W.	2	29.676	82.0	75.4	C. K.	9	W.	5	
12	29.796	81.9	72.9	C. K.	4	N. W.	4	29.637	87.0	77.4	C. K.	8	W.	5	
3	29.748	86.9	77.4	C. K.	2	S. W.	5	29.586	88.0	76.0	C. K.	8	W.	5	
6	29.681	81.9	75.4	C. K.	2	S. W.	5	29.578	76.9	69.4	C. K.	10	N. E.	5	
9	29.677	75.9	70.9	C. S.	1	S. W.	3	29.575	69.9	64.9	N.	10	N. E.	3	
Means	29.772	74.1	69.5	. .	5.1	. .	2.6	29.625	78.0	71.8	. .	8.4	. .	4.2	
JULY 13								JULY 14							
0	29.640	64.4	63.4	C. K.	9	N. E.	3	29.916	61.0	57.9	C. K.	2	N. W.	3	
3	29.677	59.9	59.4	C. K.	3	N. W.	2	29.922	59.9	57.4	Clear	0	N. W.	3	
6	29.763	56.4	54.4	C. K.	2	N. W.	4	29.957	58.6	56.4	Clear	0	N. W.	4	
9	29.800	64.9	58.9	Clear	0	N. W.	8	29.976	69.4	63.9	Clear	0	N., N. W.	2	
12	29.798	69.9	60.4	C. K.	1	N. W.	8	29.986	74.9	65.9	C. K.	2	N. W.	4	
3	29.796	74.9	63.9	C. K.	2	W., S. W.	7	29.956	78.9	67.9	C. K.	3	N. W.	4	
6	29.846	71.0	61.9	C. K.	2	N., N. W.	6	29.954	74.4	67.4	Clear	0	W.	1	
9	29.890	62.9	59.9	Clear	0	N. W.	2	29.983	66.9	64.4	C. K.	8	N. W.	1	
Means	29.776	65.5	60.3	. .	2.4	. .	5.0	29.956	68.0	62.6	. .	1.9	. .	2.8	
JULY 15								JULY 16							
0	29.987	64.4	62.9	C.	1	N. W.	1	30.005	63.9	62.4	C. K.	5	N. W.	2	
3	29.978	60.9	59.9	C. K.	10	W.	1	30.011	61.4	59.9	C. K.	7	N. W.	2	
6	30.008	61.9	60.9	C. K.	10	N. W.	1	30.032	61.4	60.4	C. K.	7	N. W.	2	
9	30.022	71.4	66.4	C. K.	9	N. W.	0	30.030	73.9	67.9	Clear	0	N., N. W.	1	
12	30.017	77.4	67.4	C. K.	9	N. W.	2	30.020	80.9	68.4	C. K.	1	N.	2	
3	29.986	81.9	70.2	C. K.	8	S.	2	30.016	79.4	67.4	C. K.	2	E.	3	
6	29.978	75.4	69.9	C. K.	6	S. W.	0	30.016	76.9	64.4	C. K.	2	E.	5	
9	29.997	69.9	65.9	C. K.	5	N. W.	1	30.034	68.9	64.9	C. K.	3	N. E.	1	
Means	29.997	70.4	65.4	. .	7.2	. .	1.0	30.020	70.8	64.5	. .	3.4	. .	2.2	

JULY 17								JULY 18							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.054	65.9	63.4	C. K.	3	N. E.	0	30.121	63.9	60.9	Clear	0	S.	2	
3	30.080	62.4	60.4	C. K.	3	N. E.	0	30.123	62.4	60.9	C. K.	2	S.	1	
6	30.112	60.9	59.4	C. K.	5	N.	0	30.122	60.4	59.4	C. K.	3	S. W.	1	
9	30.124	73.9	66.9	C. K.	3	S.	3	30.132	71.9	66.4	C. K.	4	S.	3	
12	30.111	79.4	67.4	C. K.	2	S. E.	5	30.101	78.6	66.4	C. K.	7	S. E.	6	
3	30.084	79.9	67.4	C. K.	2	S. E.	7	30.049	81.4	70.4	C. K.	4	S.	6	
6	30.085	76.4	67.4	C. K.	4	S. E.	6	30.015	76.9	67.9	C. K.	1	S.	5	
9	30.117	67.9	63.9	Clear	0	S. W.	2	30.048	70.9	65.9	C. K.	3	S. E.	5	
Means	30.096	70.8	64.5	. .	2.8	. .	2.9	30.089	70.8	64.8	. .	3.0	. .	3.6	
JULY 19								JULY 20							
0	30.052	69.4	65.9	C. K.	8	S. E.	3	29.946	69.4	68.4	C. K.	10	S.	0	
3	30.007	69.4	66.4	C. K.	10	S. E.	2	29.931	69.0	68.0	C. K.	10	S.	0	
6	30.031	69.9	68.4	C. K.	9	S. E.	2	29.951	67.9	67.4	C. K.	9	S.	0	
9	30.036	74.9	71.4	C. K.	10	S.	2	29.946	76.9	72.9	C. K.	9	W.	3	
12	30.042	75.9	72.9	N.	10	S.	1	29.974	80.9	74.4	C. K.	6	N. W.	2	
3	29.994	74.9	72.9	N.	10	S.	1	29.947	81.4	74.9	C. K.	6	S.	4	
6	29.930	72.4	70.9	N.	10	S.	3	29.942	78.4	73.9	C. K.	10	S.	2	
9	29.944	70.6	69.2	C. K.	10	N. E.	0	29.992	71.9	69.4	C. K.	10	S.	4	
Means	30.004	72.2	69.8	. .	9.6	. .	1.8	29.954	74.5	71.2	. .	8.8	. .	1.9	
JULY 21								JULY 22							
0	30.006	69.4	67.4	C. K.	10	N. W.	1	29.991	69.4	67.9	C. K.	9	N. E.	2	
3	30.007	67.4	66.4	C. K.	4	N. W.	1	29.961	68.4	67.4	C. K.	5	N.	2	
6	30.015	65.4	64.9	C. K.	3	N., N. W.	1	29.977	66.9	65.4	C. K.	5	N. W.	5	
9	30.048	72.9	66.9	C. K.	9	N. E.	6	29.986	76.4	70.4	C. K.	3	N.	4	
12	30.034	78.4	69.9	C. K.	7	N. E.	5	29.954	81.9	72.4	C. K.	3	N., N. W.	4	
3	29.999	83.4	72.9	C. K.	7	N., N. E.	4	29.916	85.4	74.4	C. K.	3	N. E.	4	
6	29.999	78.9	69.4	C. K.	5	N. E.	5	29.893	79.4	70.8	C. K.	1	W.	1	
9	30.018	73.4	68.4	C. K.	3	N. E.	3	29.916	70.4	67.9	Clear	0	W., N. W.	2	
Means	30.016	73.6	68.3	. .	6.0	. .	3.2	29.949	74.8	69.6	. .	3.6	. .	3.0	
JULY 23								JULY 24							
0	29.926	66.9	65.4	C. K.	1	W.	1	29.910	72.4	70.4	Clear	0	N. W.	1	
3	29.898	65.4	62.9	Clear	0	S.	1	29.902	68.9	67.4	C. K.	2	N. W.	2	
6	29.937	64.4	62.9	C. K.	5	S. W.	1	29.906	68.9	68.4	C. K.	3	N. W.	1	
9	29.962	78.9	72.4	C. K.	3	N. W.	1	29.929	79.9	73.6	C. K.	5	W.	2	
12	29.947	85.9	73.9	C. K.	1	N. W.	2	29.912	87.9	76.9	C. K.	4	N. W.	3	
3	29.891	89.9	76.9	C. K.	2	W.	3	29.890	83.9	75.4	C. K.	9	N. W.	3	
6	29.890	82.9	75.4	Clear	0	W.	2	29.876	82.9	75.9	C. K.	9	S. W.	1	
9	29.912	76.4	73.9	Clear	0	N. W.	1	29.951	72.9	70.9	N.	10	E.	3	
Means	29.920	76.3	70.5	. .	1.5	. .	1.5	29.910	77.2	72.4	. .	5.2	. .	2.0	

JULY 25								JULY 26							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.966	69.9	68.9	C. K.	5	N. W.	1	29.984	65.4	63.9	Clear	0	N. W.	2	
3	29.984	66.9	63.4	Clear	0	N. W.	4	29.982	63.9	59.9	Clear	0	N. W.	0	
6	30.024	64.4	62.9	C. K.	4	N. W.	3	29.996	63.2	59.9	C. K.	6	S. W.	1	
9	30.068	75.9	66.4	Clear	0	N. W.	2	30.006	76.9	68.9	C. K.	2	S. W.	2	
12	30.077	81.4	69.4	C.	1	N. W.	4	29.976	83.9	71.9	C. K.	2	S. W.	4	
3	30.040	83.4	70.9	Clear	0	S. W.	3	29.924	85.9	71.9	C. K.	1	S. W.	4	
6	29.975	77.9	66.9	Clear	0	S.	1	29.892	79.4	69.4	C. K.	1	S.	1	
9	29.994	70.4	66.9	Clear	0	N. W.	1	29.905	72.4	67.9	Clear	0	S. W.	1	
Means	30.016	73.8	67.2	. .	1.2	. .	2.4	29.958	73.9	66.7	. .	1.5	. .	1.9	
JULY 27								JULY 28							
0	29.910	70.4	65.4	C. K.	9	S.	2	29.945	65.9	64.4	C. K.	4	N. W.	2	
3	29.898	67.4	62.9	C. K.	8	S. W.	2	29.946	63.4	62.4	C. K.	4	N. W.	1	
6	29.916	65.9	62.9	C. K.	5	S.	1	30.000	63.9	62.9	C. K.	6	N.	2	
9	29.911	76.9	69.4	C. K.	6	S.	3	30.037	73.9	67.4	C. K.	1	N., N. E.	4	
12	29.906	78.9	71.4	C. K.	10	W.	1	30.048	77.9	69.9	C. K.	8	N. W.	4	
3	29.900	79.9	72.9	C. K.	10	E.	3	30.055	77.9	77.2	C. K.	8	N. E.	3	
6	29.889	76.9	72.4	C. K.	10	N. E.	1	30.028	76.4	69.4	C. K.	6	S. E.	5	
9	29.940	70.9	67.4	N.	10	N. E.	2	30.072	70.4	66.9	C. K.	3	S. E.	3	
Means	29.909	73.4	68.1	. .	8.5	. .	1.9	30.016	71.2	67.6	. .	5.0	. .	3.0	
JULY 29								JULY 30							
0	30.081	67.4	63.9	C. K.	2	S.	3	30.073	67.4	64.4	C. K.	10	S. W.	4	
3	30.082	64.9	62.4	C. K.	8	S.	1	30.046	65.4	63.4	C. K.	10	S.	2	
6	30.096	64.9	62.9	C. K.	8	E.	1	30.027	66.4	64.9	C. K.	9	S.	2	
9	30.118	72.4	66.9	C. K.	8	S. E.	4	29.998	69.4	66.9	C. K.	10	S.	3	
12	30.122	74.9	68.9	C. K.	10	S. E.	6	29.987	69.9	67.4	C. K.	10	S. W.	3	
3	30.097	73.9	68.4	C. K.	10	S. E.	1	29.950	70.9	69.4	C. K.	10	S.	3	
6	30.064	73.9	67.4	C. K.	9	S.	2	29.928	70.4	68.4	Mist	10	S. E.	2	
9	30.075	69.4	66.9	C. K.	3	S.	5	29.962	70.4	68.9	Mist	10	S.	1	
Means	30.092	70.2	66.0	. .	7.2	. .	2.9	29.996	68.8	66.7	. .	9.9	. .	2.5	
JULY 31								AUGUST 1							
0	29.942	69.9	69.4	C. K.	9	S.	1	29.874	73.4	71.9	C. K.	2	S. W.	3	
3	29.926	68.9	68.4	C. K.	9	S. W.	1	29.849	71.4	70.4	C. K.	10	S. W.	1	
6	29.948	69.4	68.9	C. K.	10	S. W.	1	29.862	71.4	70.4	C. K.	10	S.	4	
9	29.974	74.4	72.4	C. K.	10	S.	2	29.899	76.4	74.9	N.	10	S. W.	1	
12	29.964	78.9	75.9	C. K.	10	S.	2	29.903	80.9	76.4	K.	10	S. W.	2	
3	29.915	86.4	78.4	C. K.	6	S. W.	3	29.879	83.9	79.9	C. K.	9	S. W.	1	
6	29.860	80.9	75.4	C. K.	10	S. W.	3	29.853	82.4	76.9	C. K.	4	N. W.	1	
9	29.874	75.4	73.0	C. K.	3	S. W.	1	29.883	75.9	74.9	Clear	0	N. W.	2	
Means	29.925	75.5	72.7	. .	8.4	. .	1.8	29.875	77.0	74.5	. .	6.9	. .	1.9	

AUGUST 2								AUGUST 3							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.910	73.9	72.4	Clear	0	N. W.	3	29.954	69.4	67.4	C. K.	6	N. E.	2	
3	29.906	68.4	67.4	Clear	0	N. W.	2	29.944	65.9	64.4	C. K.	6	N. E.	1	
6	29.946	66.9	65.4	S.	1	N. W.	2	29.963	67.4	64.9	C. K.	9	N. W.	1	
9	29.979	77.4	67.4	Clear	0	E.	2	29.974	71.4	70.9	C. K.	9	S.	1	
12	29.971	83.9	68.9	Clear	0	E.	3	29.931	84.9	77.9	C. K.	3	S.	3	
3	29.948	85.9	72.9	C. K.	3	S. E.	3	29.902	89.4	78.4	C. K.	2	S. W.	2	
6	29.910	81.9	71.9	C. K.	2	S. E.	2	29.833	84.4	75.9	C. K.	3	S.	2	
9	29.965	73.9	67.9	C. K.	4	S. E.	1	29.864	77.8	73.4	Clear	0	S. E.	1	
Means	29.942	76.5	69.3	. .	1.2	. .	2.2	29.921	76.3	71.6	. .	4.8	. .	1.6	
AUGUST 4								AUGUST 5							
0	29.842	74.4	71.9	C. K.	3	S. E.	1	29.728	77.4	74.9	Clear	0	N. W.	1	
3	29.799	71.9	69.9	C. K.	2	S., S. E.	1	29.745	74.4	72.9	C. K. S.	6	N. W.	1	
6	29.812	71.9	70.4	C. K.	8	S.	2	29.755	73.9	72.4	C. K.	3	N. W.	2	
9	29.808	82.4	75.9	C. K.	4	S. E.	1	29.760	80.4	75.4	C. K.	9	N. W.	1	
12	29.776	91.4	80.4	C. K.	2	S. E.	4	29.748	88.1	78.9	C. K.	3	S.	2	
3	29.703	95.6	83.4	C. K.	2	S. W.	2	29.713	90.9	80.4	C. K.	8	N. W.	2	
6	29.693	86.4	80.9	C. K.	10	W.	1	29.709	82.4	76.9	C. K.	9	S. E.	4	
9	29.715	81.4	77.4	N.	10	N. W.	2	29.776	78.4	74.9	C. K.	10	N. E.	2	
Means	29.768	81.9	76.3	. .	5.1	. .	1.8	29.742	80.7	75.8	. .	6.0	. .	1.9	
AUGUST 6								AUGUST 7							
0	29.758	75.9	74.4	C. K.	8	N. E.	1	29.759	77.9	75.4	Clear	0	S. W.	0	
3	29.733	74.9	73.9	C. K.	7	N. E.	1	29.742	76.4	74.9	Clear	0	S. W.	0	
6	29.773	74.4	73.4	C. K.	7	N. E.	1	29.778	74.4	73.4	C. K.	2	S. W.	0	
9	29.824	81.9	77.4	C. K.	8	N. W.	2	29.823	85.9	77.9	C. K.	1	W.	1	
12	29.811	88.4	80.4	C. K.	4	W., N W.	3	29.848	90.6	76.9	C. K.	3	W.	3	
3	29.764	89.9	80.9	C. K.	3	N. W.	2	29.831	93.6	77.2	C. K.	1	N. W.	3	
6	29.724	86.4	78.4	C. K.	3	W.	2	29.813	86.6	75.4	Clear	0	N. W.	1	
9	29.748	80.9	77.4	Clear	0	S. W.	1	29.839	78.9	75.2	Clear	0	N. W.	0	
Means	29.767	81.6	77.0	. .	5.0	. .	1.6	29.804	83.0	75.8	. .	0.9	. .	1.0	
AUGUST 8								AUGUST 9							
0	29.830	74.2	72.2	Clear	0	N. W.	1	29.862	72.4	71.4	C. K.	4	S. W.	0	
3	29.834	73.7	71.9	Clear	0	N. W.	0	29.845	71.9	70.9	Clear	0	S. W.	1	
6	29.843	72.7	70.4	C. K.	3	N. W.	1	29.908	71.4	70.9	C. K.	10	S. W.	1	
9	29.848	84.6	77.4	C. K.	8	S.	2	29.919	79.4	75.4	C. K.	2	N. W.	1	
12	29.818	92.9	81.9	C. K.	4	S., S. E.	2	29.950	86.9	76.3	C. K.	3	N. W.	3	
3	29.758	98.4	83.6	C. K.	4	S.	2	29.917	88.8	76.9	C. K.	5	W.	4	
6	29.862	72.9	71.9	C. K.	10	S. W.	7	29.926	80.9	75.7	C. K.	9	W.	1	
9	29.864	73.4	72.4	C. K.	10	S. W.	0	29.982	75.4	68.9	C. K.	2	N. W.	2	
Means	29.832	80.4	75.2	. .	4.9	. .	1.9	29.914	78.4	73.3	. .	4.4	. .	1.6	

AUGUST 10								AUGUST 11							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.017	70.4	64.7	Clear	0	N. W.	0	30.151	66.6	65.4	Clear	0	N.	2	
3	30.044	66.4	62.2	Clear	0	N. W.	1	30.149	63.4	61.9	Clear	0	N.	0	
6	30.101	65.2	59.4	C. K.	4	N.	4	30.170	62.9	60.4	Clear	0	E.	1	
9	30.113	75.9	65.2	C. K.	2	N. E.	4	30.159	76.3	70.4	C. K.	2	S. E.	2	
12	30.133	81.9	69.9	Clear	0	N. E.	3	30.158	83.7	74.4	C. K.	4	S. W.	3	
3	30.114	84.4	71.9	C. K.	4	N. W.	2	30.112	84.9	74.9	C. K.	5	S., S. E.	4	
6	30.110	77.9	69.9	C. K.	1	S.	0	30.102	78.2	70.9	C. K.	1	S.	4	
9	30.131	71.4	66.9	C. K.	1	E.	0	30.126	72.9	68.2	Clear.	0	S., S. E.	2	
Means	30.095	74.2	66.3	. .	1.5		1.8	30.141	73.6	68.3	. .	1.5	. .	2.2	
AUGUST 12								AUGUST 13							
0	30.120	71.9	68.4	Clear	0	S.	2	29.894	68.8	67.9	N.	10	S. E.	1	
3	30.082	69.9	68.2	Clear	0	S.	2	29.871	66.4	65.4	C. K.	10	W.	1	
6	30.004	70.4	68.9	C. K.	8	S.	3	29.901	65.9	63.4	C. K.	9	N. W.	5	
9	30.032	78.9	74.4	C. K.	6	S., S. E.	3	29.968	68.9	62.4	C. K.	4	N. W.	6	
12	30.000	85.4	78.6	C. K.	8	S. W.	3	29.974	74.6	64.9	C. K.	4	N. W.	5	
3	29.916	84.9	77.9	C. K.	10	S. W.	1	29.952	76.9	64.9	C. K.	5	N. W.	4	
6	29.914	69.9	66.9	C. K.	10	E.	1	29.979	72.9	63.9	C. K.	4	N. W.	2	
9	29.898	68.9	67.9	C. K.	7	S. E.	4	30.012	65.9	62.9	C. K.	3	N. W.	1	
Means	29.996	75.0	71.4	. .	6.1	. .	2.4	29.944	70.0	64.5	. .	6.1	. .	3.1	
AUGUST 14								AUGUST 15							
0	30.046	62.9	60.9	C. K.	3	N. W.	1	30.045	66.9	65.0	Clear	0	S.	1	
3	30.053	60.4	58.4	C. K.	2	N. W.	3	30.044	66.4	64.4	C. K.	2	S.	1	
6	30.090	59.9	57.9	C. K.	4	N. W.	1	30.050	66.4	64.8	C. K.	9	S.	1	
9	30.128	69.9	63.4	C. K.	4	W.	2	30.050	76.1	70.9	Clear	0	S. W.	2	
12	30.115	77.9	66.9	C. K.	3	N. W.	4	30.030	87.4	76.9	C. K.	4	W.	1	
3	30.047	79.2	69.4	C. K.	6	S. W.	3	29.999	90.9	78.4	C. K.	4	S. W.	1	
6	30.033	75.4	68.4	C. K.	1	S.	2	29.959	83.4	75.4	C. K.	3	S. W.	1	
9	30.048	69.4	65.9	Clear	0	S.	2	29.980	76.4	72.9	C. K.	2	S. W.	1	
Means	30.070	69.4	63.9	. .	2.9	. .	3.2	30.020	76.7	71.1	. .	3.0	. .	1.1	
AUGUST 16								AUGUST 17							
0	30.014	74.9	72.4	C. K.	6	S. W.	1	29.953	77.9	74.4	C. K.	4	S.	1	
3	29.994	73.9	71.9	C. K.	9	S. W.	1	29.942	74.4	71.9	C. K.	3	S.	1	
6	30.038	73.9	71.9	C. K.	9	S. W.	1	29.944	72.9	70.4	C. K.	8	S.	1	
9	30.054	83.9	77.9	Clear	0	S. W.	1	29.939	81.9	74.9	C. K.	8	S. W.	2	
12	30.024	91.9	79.4	Clear	0	N. W.	2	29.896	89.4	79.6	C. K.	8	S. W.	4	
3	29.973	94.4	82.4	C. K.	3	S. W.	4	29.854	86.2	76.9	C. K.	10	S. W.	4	
6	29.957	86.9	78.4	C. K.	7	S.	0	29.871	81.4	76.9	C. K.	9	S. W.	1	
9	29.960	80.4	76.9	C. K.	8	S.	2	29.908	77.4	74.4	C. K.	9	S. W.	1	
Means	30.002	82.5	76.4	. .	5.2	. .	1.5	29.913	80.2	74.9	. .	7.4	. .	1.9	

AUGUST 18								AUGUST 19							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.950	76.4	73.4	C. K.	10	S. W.	1	29.964	71.9	70.9	N.	10	S. W.	0	
3	29.947	74.9	72.9	C. K.	10	S. W.	1	29.955	70.4	69.4	N.	10	N.	0	
6	29.974	73.9	72.4	C. K.	10	S. W.	1	29.987	70.4	69.4	N.	10	S. W.	0	
9	29.991	77.9	75.4	C. K.	10	S. W.	1	30.020	68.9	67.9	N.	10	N.	1	
12	29.993	79.4	75.4	C. K.	10	N. W.	1	30.019	71.4	67.7	C. K.	10	W.	1	
3	29.966	83.9	76.2	C. K.	8	N. W.	1	29.963	78.4	71.4	C. K.	4	W.	1	
6	29.955	76.8	74.9	N.	10	W.	0	29.948	73.9	69.9	C. K.	10	S. W.	1	
9	29.942	72.4	71.4	C. K.	10	S.	0	29.948	72.4	69.4	N.	10	N. E.	1	
Means	29.965	77.0	74.0	. .	9.8	. .	0.8	29.976	72.2	69.5	. .	9.2	. .	0.6	
AUGUST 20								AUGUST 21							
0	29.940	71.4	69.4	C. K.	10	S.	1	29.869	73.4	71.9	C. K.	10	E.	0	
3	29.913	69.9	68.4	C. K.	10	S. W.	1	29.810	73.0	71.9	N.	10	E.	0	
6	29.948	68.9	67.9	C. K.	10	N. W.	1	29.762	73.4	71.9	Mist	10	S.	0	
9	29.961	71.4	70.4	C. K.	10	N. W.	0	29.723	76.2	74.2	C. K.	10	S. W.	0	
12	29.946	75.9	72.2	C. K.	10	W.	0	29.639	78.9	75.9	N.	10	S. E.	4	
3	29.915	79.6	73.8	N.	10	E.	0	29.466	80.9	76.4	C. K.	8	S., S. E.	7	
6	29.884	77.9	73.9	C. K.	10	S. E.	0	29.379	80.9	75.4	N.	10	W.	6	
9	29.904	74.9	72.4	C. K.	10	S. E.	0	29.375	76.9	73.9	C. K.	9	W.	5	
Means	29.926	73.7	71.0	. .	10.0	. .	0.4	29.628	76.7	73.9	. .	9.6	. .	2.8	
AUGUST 22								AUGUST 23							
0	29.518	68.9	67.9	C. K.	10	W.	6	30.032	57.4	55.4	Clear	0	N. W.	3	
3	29.661	66.4	66.9	C. K.	7	N. W.	1	30.057	54.4	52.9	Clear	0	N. W.	1	
6	29.723	64.4	63.4	C. K.	7	S. W.	2	30.096	52.4	50.4	Clear	0	N. W.	3	
9	29.776	73.9	66.4	C. K.	4	N. W.	5	30.116	63.4	57.9	Clear	0	N. W.	6	
12	29.839	76.4	67.4	C. K.	5	N. W.	7	30.105	71.4	61.9	C. K.	4	N. W.	3	
3	29.861	69.9	62.6	C. K.	10	N. W.	4	30.078	75.2	63.2	Clear	0	N. W.	4	
6	29.916	68.4	59.2	C. K.	4	N.	2	30.065	69.4	60.4	C. K.	3	W.	1	
9	29.991	60.6	55.9	Clear	0	N. W.	2	30.096	62.9	58.4	C. K.	5	S. W.	1	
Means	29.786	68.6	63.7	. .	5.9	. .	3.6	30.081	63.3	57.6	. .	1.5	. .	2.8	
AUGUST 24								AUGUST 25							
0	30.095	60.4	57.9	Clear	0	N. W.	2	29.991	64.4	61.9	Clear	0	S. W.	0	
3	30.091	57.9	56.9	Clear	0	S. W.	1	29.994	58.0	56.4	Clear	0	W.	1	
6	30.122	55.9	54.9	C. K.	1	S. W.	1	30.008	56.9	55.9	Clear	0	W.	2	
9	30.109	71.4	63.9	Clear	0	W.	1	30.031	69.9	62.9	Clear	0	N. W.	1	
12	30.064	81.2	67.9	Clear	0	S. W.	1	30.016	81.2	69.8	Clear	0	N. W.	4	
3	30.018	83.2	71.9	Clear	0	S. W.	2	29.974	87.4	71.4	Clear	0	N. W.	3	
6	29.950	75.9	67.4	Clear	0	S. W.	2	29.966	77.4	68.4	Clear	0	S. W.	1	
9	29.977	67.9	62.9	Clear	0	S. W.	0	29.970	67.9	64.4	Clear	0	N. W.	1	
Means	30.053	69.2	63.0	. .	0.1	. .	1.2	29.994	70.4	63.9	. .	0.0	. .	1.6	

AUGUST 26								AUGUST 27							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°	.				
0	29.974	62.9	61.9	Clear	0	S.	1	29.928	70.4	66.4	C. K.	7	S.	1	
3	29.974	61.4	59.9	Clear	0	N. W.	1	29.918	68.4	65.9	C. K.	2	S., S. W.	0	
6	30.001	59.9	58.9	Clear	0	N. W.	2	29.910	66.9	64.9	C. K.	9	W.	1	
9	30.021	75.4	69.9	Clear	0	S. W.	1	29.920	73.9	70.4	C. K.	8	S. W.	1	
12	30.001	85.2	73.7	Clear	0	S., S. W.	3	29.899	81.8	75.4	C. K.	10	S. W.	2	
3	29.948	89.9	74.4	C. K.	1	S. W.	3	29.868	80.4	73.9	C. K.	10	W.	2	
6	29.922	79.9	71.0	C. K.	1	S.	3	29.904	68.9	67.4	N.	10	N. W.	2	
9	29.940	73.4	68.4	C. K.	3	S. W.	0	29.932	67.9	66.9	C. K.	9	N. W.	1	
Means	29.973	73.5	67.3	. .	0.6	. .	1.8	29.910	72.3	68.9	. .	8.1	. .	1.2	
AUGUST 28								AUGUST 29							
0	29.970	68.4	65.4	C. K.	10	N. E.	3	29.955	56.4	55.4	Clear	0	N. W.	1	
3	30.020	62.9	57.9	C. K.	10	N.	3	29.973	52.9	51.9	Clear	0	N. W.	1	
6	30.052	57.4	54.9	C. K.	9	N. W.	1	29.977	51.9	51.4	Fog	10	N. W.	1	
9	30.065	66.3	58.4	Clear	0	N., N. W.	4	29.961	67.4	61.8	C. K.	4	S.	1	
12	30.036	72.4	61.8	Clear	0	N. W.	4	29.930	77.6	66.4	C. K.	3	S. W.	3	
3	29.990	76.9	62.9	Clear	0	N.	2	29.864	81.6	69.9	C. K.	3	S. W.	4	
6	29.945	70.4	61.6	Clear	0	W.	1	29.852	74.9	67.9	C. K.	4	S. W.	2	
9	29.985	60.4	58.9	Clear	0	N. W.	2	29.880	68.4	65.4	C. K.	2	S.	1	
Means	30.008	66.9	60.2	. .	3.6	. .	2.5	29.924	66.4	61.3	. .	3.2	. .	1.8	
AUGUST 30								AUGUST 31							
0	29.883	65.9	63.4	C. K.	5	S.	2	29.871	68.9	66.2	C. K.	2	S.	2	
3	29.859	63.4	61.4	C. K.	5	S. W.	2	29.856	67.4	66.0	C. K.	3	S.	0	
6	29.912	62.4	60.9	C. K.	6	S. W.	2	29.872	67.9	67.4	C. K.	4	S.	2	
9	29.925	71.9	67.4	C. K.	4	S. W.	2	29.866	76.2	72.4	C. K.	10	S.	3	
12	29.908	80.4	75.0	C. K.	3	S. E.	7	29.837	78.4	72.4	N.	10	S.	3	
3	29.870	84.6	78.9	C. K.	1	S. W.	3	29.779	77.2	72.9	C. K.	10	S. E.	. .	
6	29.824	78.6	71.9	C. K.	3	S.	2	29.755	75.4	72.4	N.	10	S.	2	
9	29.873	71.4	66.9	C. K.	2	S.	4	29.759	73.9	72.4	N.	10	S.	1	
Means	29.882	72.3	68.2	. .	3.6	. .	3.0	29.824	73.2	70.3	. .	7.4	. .	1.9	
SEPTEMBER 1								SEPTEMBER 2							
0	29.729	72.4	71.9	K.	10	S.	1	29.854	68.8	67.0	C. K.	3	N. W.	3	
3	29.714	71.4	70.9	K.	10	S.	1	29.901	65.4	63.4	C. K.	7	N. W.	4	
6	29.744	70.9	70.4	K.	10	S.	1	29.971	63.9	62.2	C. K.	4	N. W.	3	
9	29.772	73.9	72.2	C. K.	10	W.	. .	30.029	68.0	63.9	C. K.	6	N. W.	4	
12	29.790	78.4	72.6	C. K.	8	N. E.	. .	30.048	75.9	64.4	Clear	0	N.	5	
3	29.784	71.9	69.2	N.	10	N. W.	4	30.044	80.9	66.9	Clear	0	N.	4	
6	29.781	71.7	70.4	C. K.	9	N. W.	1	30.034	72.9	62.9	Clear	0	N. E.	2	
9	29.863	70.4	69.4	C. K.	10	N. W.	1	30.106	64.9	60.9	Clear	0	N. E.	2	
Means	29.772	72.6	70.9	. .	9.6	. .	1.5	29.998	70.1	64.0	. .	2.5	. .	3.4	

SEPTEMBER 3								SEPTEMBER 4							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.120	62.9	58.9	C. K.	3	N. W.	2	30.053	62.4	60.0	N.	10	N., N. W.	1	
3	30.099	60.9	57.4	C. K.	3	N. W.	1	30.015	63.4	61.2	N.	10	N. E.	2	
6	30.136	58.4	55.9	C. K.	9	N. W.	1	30.005	62.9	61.9	N.	10	N. E.	2	
9	30.161	65.2	61.4	C. K.	10	N.	1	30.015	65.4	64.6	N.	10	N. E.	1	
12	30.154	72.0	67.9	C. K.	10	S. E.	2	30.005	67.4	65.9	N.	10	N. E.	1	
3	30.112	68.4	65.9	N.	10	S. E.	3	29.964	69.2	67.2	C. K.	10	N. E.	1	
6	30.069	63.9	61.4	N.	10	E.	3	29.955	69.9	67.9	C. K.	10	N. E.	1	
9	30.081	62.4	59.4	C. K.	10	E.	1	29.981	68.9	67.9	C. K.	10	S.	1	
Means	30.118	64.3	61.0	. .	8.1	. .	1.8	29.999	66.2	64.6	. .	10.0	. .	1.2	
SEPTEMBER 5								SEPTEMBER 6							
0	29.986	67.9	66.9	Clear	0	S. W.	1	30.161	65.6	58.9	C. K.	10	N. E.	6	
3	29.980	65.9	64.9	Clear	0	S. W.	1	30.195	61.4	54.9	C. K.	10	N. E.	5	
6	29.992	64.9	63.9	Fog	10	N. W.	1	30.244	59.4	53.9	C. K.	10	N. E.	4	
9	30.011	67.9	66.9	C. K.	8	N. W.	1	30.296	58.9	54.0	C. K.	10	N. E.	3	
12	30.043	79.6	73.9	C. K.	6	N.	2	30.337	62.2	56.3	C. K.	10	E.	6	
3	30.020	77.4	70.9	C. K.	5	N. E.	2	30.322	62.8	56.2	C. K.	10	N. E.	4	
6	30.040	73.9	69.4	C. K.	9	E.	4	30.340	61.9	56.4	C. K.	10	N. E.	2	
9	30.116	68.9	66.4	C. K.	9	N.	3	30.389	58.9	54.4	C. K.	10	N. E.	2	
Means	30.024	70.8	67.9	. .	5.9	. .	1.9	30.286	61.4	55.6	. .	10.0	. .	4.0	
SEPTEMBER 7								SEPTEMBER 8							
0	30.404	56.4	52.4	C. K.	10	N. E.	1	30.212	58.2	57.9	N.	10	N. E.	3	
3	30.386	55.9	51.9	C. K.	10	N. E.	2	30.126	58.9	58.4	N.	10	N.	1	
6	30.397	53.9	51.4	C. K.	10	N. E.	3	30.098	59.4	58.9	N.	10	N. W.	1	
9	30.411	58.9	54.9	N.	10	N. E.	2	30.083	63.9	59.4	N.	10	N. W.	1	
12	30.397	58.9	56.4	N.	10	N. E.	3	30.057	61.9	60.9	N.	10	N. W.	2	
3	30.348	57.6	56.8	N.	10	N. E.	3	30.004	64.9	63.9	N.	10	W.	1	
6	30.286	58.0	57.4	N.	10	N. E.	3	29.984	67.4	66.9	K.	10	S.	2	
9	30.264	57.9	57.4	N.	10	N. E.	3	29.985	67.9	66.4	K.	10	S.	1	
Means	30.362	57.2	54.8	. .	10.0	. .	2.5	30.069	62.8	61.6	. .	10.0	. .	1.5	
SEPTEMBER 9								SEPTEMBER 10							
0	29.989	67.9	66.9	K.	10	S.	1	29.808	69.9	68.9	C. K.	8	N. W.	1	
3	29.973	67.4	66.9	K.	10	S. E.	1	29.819	67.9	66.9	C. K.	10	N. W.	2	
6	29.957	68.4	67.9	Fog	10	S. E.	1	29.883	66.9	64.4	C. K.	10	W.	1	
9	29.960	69.7	69.2	N.	10	S. E.	0	29.906	68.2	67.4	C. K.	10	N. W.	1	
12	29.928	73.4	72.0	C. K.	10	N.	1	29.901	71.4	68.4	N.	10	N. E.	3	
3	29.850	77.9	73.4	C. K.	9	E.	2	29.892	69.4	67.6	C. K.	10	N. E.	4	
6	29.804	74.4	72.4	C. K.	10	N. E.	2	29.919	66.9	63.2	C. K.	10	N. E.	5	
9	29.800	71.4	69.9	C. K.	8	N. W.	2	29.910	62.9	61.9	N.	10	N.	5	
Means	29.904	71.3	69.8	. .	9.6	. .	1.2	29.880	67.9	66.1	. .	9.8	. .	2.8	

SEPTEMBER 11								SEPTEMBER 12							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.863	60.7	59.9	N.	10	N.	6	29.923	62.9	62.4	K.	10	N. W.	4	
3	29.859	60.9	60.0	N.	10	N. E.	5	29.942	60.9	60.4	C. K.	7	W.	2	
6	29.849	61.9	61.4	N.	10	N. E.	7	29.980	58.4	57.9	C. K.	7	S. W.	1	
9	29.854	63.9	62.9	N.	10	N. E.	6	29.964	68.4	65.4	Clear	0	S. W.	2	
12	29.849	64.2	63.4	N.	10	N. E.	7	29.932	81.2	71.9	Clear	0	W.	3	
3	29.835	63.4	62.6	N.	10	N., N. W.	7	29.895	85.9	74.9	Clear	0	S. W.	3	
6	29.851	63.4	62.9	K.	10	N., N. W.	6	29.851	75.3	69.2	C. K.	2	S.	3	
9	29.903	63.4	62.9	N.	10	N., N. W.	4	29.864	68.9	66.0	C. K.	8	S.	1	
Means	29.858	62.7	62.0	. .	10.0	. .	6.0	29.919	70.2	66.0	. .	4.2	. .	2.4	
SEPTEMBER 13								SEPTEMBER 14							
0	29.858	66.0	63.9	Clear	0	S.	2	30.061	56.4	52.9	Clear	0	N. W.	5	
3	29.842	63.0	61.9	Clear	0	N. W.	1	30.091	51.4	50.4	Clear	0	N. W.	3	
6	29.856	61.4	60.4	Fog	10	N. W.	1	30.148	50.9	48.9	Clear	0	N. W.	3	
9	29.900	70.9	66.4	Clear	0	N. W.	4	30.170	62.4	55.9	Clear	0	N. E.	4	
12	29.921	71.9	63.2	Clear	0	N. W.	8	30.162	69.4	65.4	Clear	0	S. E.	2	
3	29.922	72.8	62.9	Clear	0	N. W.	7	30.126	73.0	62.9	Clear	0	S. E.	1	
6	29.948	64.9	58.9	Clear	0	N. W.	4	30.096	65.4	61.4	C. K.	2	S.	1	
9	30.015	57.4	53.9	Clear	0	N. W.	4	30.107	59.4	57.4	C. K.	1	S. W.	0	
Means	29.908	66.0	61.4	. .	1.2	. .	3.9	30.120	61.0	56.9	. .	0.4	. .	2.4	
SEPTEMBER 15								SEPTEMBER 16							
0	30.105	55.9	54.4	C. K.	3	N.	2	29.979	63.9	61.9	N.	10	N. E.	4	
3	30.100	57.4	55.9	C. K.	6	N. E.	0	29.895	66.9	65.9	K.	10	N. E.	3	
6	30.120	58.4	57.4	C. K.	10	N., N. E.	0	29.891	68.9	67.9	K.	10	N. E.	6	
9	30.131	63.0	60.7	C. K.	10	N. E.	1	29.861	71.4	70.6	N.	10	S. E.	7	
12	30.104	73.7	65.6	C. K.	7	S. E.	4	29.814	79.4	75.4	C. K.	9	S. W.	7	
3	30.052	75.4	65.9	C. K.	8	S. E.	7	29.764	72.4	71.9	N.	10	N. W.	6	
6	30.040	69.4	63.4	C. K.	10	S. E.	5	29.804	70.9	69.9	N.	10	S.	3	
9	30.029	65.4	61.4	C. K.	10	E.	8	29.822	69.9	69.2	C. K.	10	S.	3	
Means	30.085	64.8	60.6	. .	8.0	. .	3.4	29.854	70.5	69.1	. .	9.9	. .	4.9	
SEPTEMBER 17								SEPTEMBER 18							
0	29.848	70.4	69.9	C. K.	10	S.	2	29.876	66.4	65.9	N.	10	N. W.	4	
3	29.860	67.4	66.9	C. K.	10	S.	0	29.883	64.9	63.9	N.	10	N. W.	3	
6	29.883	67.4	66.9	C. K.	10	E.	1	29.949	63.9	62.9	K.	10	W., N. W.	2	
9	29.886	68.4	66.9	N.	10	N.	1	29.995	68.2	66.4	C. K.	8	N. W.	0	
12	29.876	71.3	70.7	N.	10	S. E.	5	29.997	76.9	69.9	C. K.	6	N.	1	
3	29.830	73.9	73.2	C. K.	10	S. E.	5	29.970	78.4	70.2	C. K.	8	N. W.	1	
6	29.806	73.9	73.4	N.	10	S. E.	5	29.954	72.4	69.4	C. K.	9	N. W.	0	
9	29.832	72.4	71.9	N.	10	S., S. W.	4	29.991	67.8	66.4	C. K.	5	N. W.	0	
Means	29.853	70.6	70.0	. .	10.0	. .	2.9	29.952	69.9	66.9	. .	8.2	. .	1.4	

SEPTEMBER 19								SEPTEMBER 20							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.988	65.4	64.4	C. K.	10	N.	2	30.022	60.9	60.4	C. K.	9	N. W.	2	
3	29.984	64.6	63.9	C. K.	10	N. W.	2	30.009	59.4	58.9	C. K.	3	N. W.	2	
6	30.009	64.9	63.9	C. K.	10	N. W.	2	30.040	58.4	57.9	C. K.	3	N. W.	4	
9	30.038	67.9	65.9	C. K.	8	W., N. W.	2	30.064	65.2	63.9	C. K.	3	N. W.	3	
12	30.024	77.9	68.4	C. K.	5	N. E.	1	30.032	79.9	70.9	C. K.		S.	3	
3	29.986	76.9	68.9	C. K.	8	N. W.	1	29.982	77.9	70.4	C. K.		S. W.	2	
6	29.996	68.9	65.9	C. K.	4	N. W.	2	29.925	72.4	69.4	C. K.	10	S.	1	
9	30.023	64.4	62.9	C. K.	7	N. W.	3	29.937	70.0	67.4	C. K.	10	S.	1	
Means	30.006	68.9	65.5	. .	7.8	. .	1.9	30.001	68.0	64.9	. .	6.3	. .	2.2	
SEPTEMBER 21								SEPTEMBER 22							
0	29.901	68.9	67.9	C. K.	9	S.	2	29.984	57.9	56.9	Clear	0	N. W.	2	
3	29.891	65.4	65.0	Fog	4	N. W.	1	29.993	55.4	54.4	Clear	0	N. W.	1	
6	29.930	62.9	61.9	C. K.	9	N. W.	1	30.029	54.9	53.9	Clear	0	N. W.	2	
9	29.939	67.2	64.9	Clear	0	N. W.	2	30.059	63.9	59.4	Clear	0	N. W.	2	
12	29.941	74.9	64.9	C. K.	3	N. W.	4	30.047	72.0	63.6	C. K.	4	N. W.	4	
3	29.909	77.4	70.9	C. K.	4	N.	3	30.003	71.4	62.9	C. K.	2	N. W.	2	
6	29.913	66.4	62.9	C. K.	5	N. W.	3	29.999	66.9	61.4	C. K.	6	N.	1	
9	29.973	60.9	58.4	Clear	0	N. W.	2	30.030	60.4	58.9	C. K.	8	N. W.	2	
Means	29.925	68.0	64.6	. .	4.2	. .	2.2	30.018	62.8	58.9	. .	2.5	. .	2.0	
SEPTEMBER 23								SEPTEMBER 24							
0	30.035	57.4	56.4	C. K.	7	N. W.	1	30.062	58.4	57.9	C. K.	10	N. E.	2	
3	30.031	55.8	54.8	C. K.	9	N. W.	2	30.065	58.4	57.4	C. K.	10	N. E.	2	
6	30.052	56.4	54.9	C. K.	8	N.	3	30.079	57.9	54.9	C. K.	10	N. E.	4	
9	30.083	63.9	58.9	C. K.	4	N.	2	30.112	59.6	55.4	C. K.	10	N. E.	5	
12	30.065	70.4	61.9	C. K.	9	N. E.	3	30.098	63.9	57.4	C. K.	9	N. E.	5	
3	30.031	69.4	60.4	C. K.	6	N., N. E.	2	30.069	65.4	57.4	C. K.	9	N. E.	6	
6	30.037	63.9	59.4	C. K.	8	N. W.	3	30.062	62.9	55.4	C. K. S.	9	E.	4	
9	30.044	58.4	57.4	C. K.	4	N. W.	3	30.057	57.9	55.9	C. K.	7	E.	1	
Means	30.047	62.0	58.0	. .	6.9	. .	2.4	30.076	60.6	56.5	. .	9.2	. .	3.6	
SEPTEMBER 25								SEPTEMBER 26							
0	30.021	54.4	53.4	C. K.	10	N. E.	0	29.647	53.6	52.8	C. K.	4	N. W.	3	
3	29.977	53.9	52.9	C. K.	10	N. E.	1	29.605	52.4	51.4	C. K.	9	N. W.	4	
6	29.951	55.4	54.4	K.	10	N. E.	2	29.621	49.9	48.9	C. K.	4	N. W.	3	
9	29.938	58.4	54.9	C. K.	10	N. E.	3	29.637	59.4	56.4	Clear	0	W.	2	
12	29.885	58.9	55.9	N.	10	N. E.	4	29.617	70.9	62.9	C. K.	2	W., N. W.	3	
3	29.807	57.9	55.9	N.	10	N. E.	2	29.583	70.4	63.4	C. K.	9	W., N. W.	2	
6	29.746	57.1	57.0	N.	10	N. W.	3	29.616	64.9	61.4	C. K.	5	N. W.	3	
9	29.702	55.4	54.4	C. K.	9	N. W.	5	29.687	57.9	55.9	Clear	0	N. W.	2	
Means	29.878	56.4	54.8	. .	9.9	. .	2.5	29.627	59.9	56.6	. .	4.1	. .	2.8	

SEPTEMBER 27								SEPTEMBER 28							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.692	53.4	52.4	Clear	0	N. W.	2	29.862	55.4	54.4	C. K.	9	W.	1	
3	29.702	52.4	51.4	C. K.	2	W.	1	29.886	50.9	49.9	Clear	0	N. W.	1	
6	29.744	49.9	48.9	C. K.	4	S. W.	1	29.912	47.4	46.4	Clear	0	N. W.	2	
9	29.746	62.9	58.9	C. K.	4	S.	3	30.008	57.4	52.9	C. K.	2	N. W.	2	
12	29.732	68.9	63.4	C. K.	9	S. E.	2	30.007	60.9	52.9	C. K.	3	N. W.	6	
3	29.717	68.4	63.9	N.	10	N. W.	0	29.994	62.4	53.4	C. K.	3	N. W.	7	
6	29.754	63.4	61.4	C. K.	6	N. W.	1	30.003	55.4	49.4	C. K.	3	N. W.	5	
9	29.814	58.4	56.4	K.	10	N. W.	2	30.052	50.4	46.9	C. K.	2	N. W.	4	
Means	29.738	59.7	57.1	. .	5.6	. .	1.5	29.966	55.0	50.8	. .	2.8	. .	3.5	
SEPTEMBER 29								SEPTEMBER 30							
0	30.054	45.4	44.4	C. K.	1	N. W.	2	30.050	42.4	40.9	C. K.	2	N. W.	3	
3	30.048	46.4	43.9	C. K.	10	N. W.	2	30.041	40.9	38.9	Clear	0	N. W.	5	
6	30.056	45.9	43.9	C. K.	10	N. W.	2	30.050	39.4	37.9	Clear	0	N. W.	3	
9	30.048	51.9	48.4	C. K.	7	N. W.	2	30.052	49.4	44.4	C. K.	2	N. W.	4	
12	30.017	54.4	48.4	C. K.	8	N. W.	5	30.006	58.4	50.2	C. K.	8	W.	4	
3	30.019	49.9	46.4	C. K.	10	N. W.	7	29.939	55.9	49.2	C. K.	7	W.	3	
6	30.040	47.9	45.4	C. K.	8	N. W.	3	29.928	52.4	49.9	C. K.	9	W., S. W.	1	
9	30.068	44.9	43.4	C. K.	6	N. W.	2	29.930	48.9	45.9	K.	10	N. W.	1	
Means	30.044	48.3	45.5	. .	7.5	. .	3.1	30.000	48.5	44.7	. .	4.8	. .	3.0	
OCTOBER 1								OCTOBER 2							
0	29.877	46.4	45.4	C.	10	W.	2	29.453	62.4	56.4	C. K.	4	S.	9	
3	29.801	46.9	44.9	K.	10	N. W.	1	29.445	60.0	56.4	N.	10	S.	3	
6	29.739	47.4	45.9	K.	10	S.	2	29.459	56.2	54.9	C. K.	10	S. W.	4	
9	29.715	50.9	47.9	K.	10	S., S. W.	5	29.485	60.9	58.4	C. K.	10	S. W.	4	
12	29.615	65.9	57.9	C. K.	4	S.	6	29.531	60.9	55.4	C. K.	10	N. W.	7	
3	29.534	71.4	60.9	C. K.	3	S., S. W.	10	29.557	57.4	50.4	C. K.	10	N. W.	11	
6	29.456	65.4	57.4	C. K.	9	S.	10	29.623	53.4	47.4	C. K.	7	N. W.	8	
9	29.429	64.4	56.4	C. K.	4	S.	10	29.688	49.4	44.4	C. K.	4	N. W.	8	
Means	29.646	57.3	52.1	. .	7.5	. .	5.8	29.530	57.6	53.0	. .	8.1	. .	6.8	
OCTOBER 3								OCTOBER 4							
0	29.759	44.9	41.9	C. K.	4	N. W.	6	30.051	40.4	39.4	Clear	0	N. W.	2	
3	29.822	43.4	40.9	Clear	0	N. W.	4	30.065	36.9	35.9	Clear	0	N. W.	2	
6	29.893	39.9	38.4	C. K.	2	N. W.	3	30.109	35.9	35.4	Fog.	0	N. W.	1	
9	29.945	45.9	40.6	C. K.	1	N. W.	6	30.136	48.9	43.9	Clear	0	S.	3	
12	29.968	52.9	43.4	C. K.	8	N. W.	9	30.095	59.9	50.4	Clear	0	S. W.	5	
3	29.958	54.4	43.6	C. K.	4	N. W.	8	30.010	62.4	53.4	Clear	0	S., S. W.	5	
6	29.984	45.9	40.9	C. K. S.	3	N., N. W.	4	29.972	55.9	50.9	C. K.	1	S.	1	
9	30.039	41.4	40.4	Clear	0	N., N. W.	1	29.982	49.6	48.4	C. K.	2	S.	1	
Means	29.921	46.1	41.3	. .	2.8	. .	5.1	30.052	48.7	44.7	. .	0.4	. .	2.5	

OCTOBER 5								OCTOBER 6							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.969	50.4	48.4	C. K.	2	S. E.	2	29.907	56.9	54.4	C. K.	9	S. E.	1	
3	29.975	47.9	46.4	Clear	0	S. E.	0	29.861	55.9	54.4	C. K.	9	S. E.	1	
6	29.985	44.9	44.4	C. K.	3	S. E.	. .	29.839	55.4	54.9	C. K.	10	S. E.	1	
9	30.017	54.4	51.4	C. K.	4	S. E.	2	29.809	61.9	60.9	C. K.	10	S. W.	2	
12	29.990	67.9	59.2	C. K.	5	S.	3	29.746	64.9	62.9	C. K.	10	S., S. W.	4	
3	29.942	73.4	61.9	C. K.	1	S.	3	29.641	70.0	64.9	C. K.	8	S., S. W.	7	
6	29.910	64.9	57.4	C. K.	8	S. E.	1	29.611	64.9	61.9	C. K.	10	S., S. W.	4	
9	29.927	57.4	54.4	C. K.	7	S. E.	1	29.632	60.9	59.9	N.	10	N. W.	1	
Means	29.964	57.6	52.9	. .	3.8	. .	1.7	29.756	61.4	59.3	. .	9.5	. .	2.6	
OCTOBER 7								OCTOBER 8							
0	29.634	56.4	54.4	C. K.	3	N. W.	6	29.565	50.9	47.9	C. K.	10	N. W.	2	
3	29.630	53.9	51.4	C.	2	N. W.	2	29.537	50.6	48.9	C. K.	10	N. W.	2	
6	29.665	48.9	46.4	C. S.	2	N. W.	8	29.557	50.8	49.0	C. K.	10	N. W.	2	
9	29.691	52.9	47.9	Clear	0	N. W.	6	29.579	54.9	50.4	C. K.	8	N. W.	8	
12	29.668	61.4	53.4	C. K.	3	N. W.	6	29.583	56.4	50.4	C. K.	10	N. W.	7	
3	29.605	64.9	54.9	C. K.	2	N. W.	6	29.538	59.9	51.9	C. K.	7	N. W.	7	
6	29.584	57.4	50.9	C. K.	10	N. W.	5	29.595	52.9	48.9	C. K.	4	N. W.	3	
9	29.607	53.2	49.9	C. K.	10	N. W.	3	29.645	50.4	47.4	C. K.	10	N. W.	2	
Means	29.636	56.1	51.2	. .	4.0	. .	5.2	29.575	53.4	49.4	. .	8.6	. .	4.1	
OCTOBER 9								OCTOBER 10							
0	29.681	47.9	44.4	C. K.	8	N. W.	3	29.924	37.4	36.4	Clear	0	N. W.	1	
3	29.720	43.9	38.9	C. K.	10	N. W.	6	29.904	36.4	35.9	Clear	0	N. W.	3	
6	29.765	41.4	36.9	C. K.	10	N. W.	7	29.965	35.9	35.4	Clear	0	N. W.	1	
9	29.791	43.9	38.4	C. K.	10	N. W.	6	29.996	46.9	42.4	Clear	0	N. W.	2	
12	29.797	49.4	41.9	C. K.	4	N. W.	9	29.960	57.9	48.9	Clear	0	N. W.	4	
3	29.782	53.9	44.4	C. K.	1	N. W.	7	29.927	60.9	49.9	C. K.	2	N. W.	3	
6	29.797	47.4	41.9	S.	1	N. W.	4	29.916	51.9	46.9	C. K.	9	N. W.	1	
9	29.893	39.9	37.4	Clear	0	N. W.	1	29.917	45.4	43.7	C. K.	9	N. W.	2	
Means	29.778	46.0	40.5	. .	5.5	. .	5.4	29.939	46.6	42.4	. .	2.5	. .	2.1	
OCTOBER 11								OCTOBER 12							
0	29.913	43.4	42.4	C. K.	9	N. W.	2	29.421	47.4	46.4	N.	10	N. E.	9	
3	29.898	44.4	41.4	C. K.	10	N. W.	1	29.395	48.9	48.4	N.	10	N. W.	5	
6	29.885	44.4	41.0	C. K.	10	N. W.	6	29.534	43.9	42.9	K.	10	N. W.	4	
9	29.863	43.9	40.4	C. K.	10	N. E.	6	29.603	47.9	45.4	C. K.	5	S. W.	4	
12	29.795	45.4	42.4	C. K.	10	N. E.	4	29.623	58.9	52.4	C. K.	7	S. W.	2	
3	29.626	48.9	45.4	C. K.	10	N. E.	8	29.621	54.4	49.2	C. K.	10	S. W.	4	
6	29.589	47.9	44.4	N.	10	N. E.	9	29.640	49.4	46.9	C. K.	10	S. W.	1	
9	29.519	45.9	44.4	N.	10	N. E.	8	29.667	47.4	45.9	C. K.	9	S. W.	1	
Means	29.761	45.5	42.7	. .	9.9	. .	5.5	29.563	49.8	47.2	. .	8.9	. .	4.1	

OCTOBER 13								OCTOBER 14							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.638	47.4	46.4	K.	10	S. W.	1	29.764	44.9	43.4	C. K.	5	N. W.	1	
3	29.618	45.4	44.4	C.	6	S. W.	1	29.776	41.4	39.9	Clear	0	N. W.	1	
6	29.628	44.9	43.4	C. K.	8	S.	2	29.793	40.9	39.9	C. K.	7	S. W.	1	
9	29.646	50.8	47.9	C. K.	8	S. W.	4	29.838	50.9	47.4	C. K.	2	N. W.	4	
12	29.635	61.9	54.2	C. K.	4	N. W.	6	29.861	53.9	48.4	C. K.	5	N. W.	6	
3	29.632	57.4	51.4	C. K.	10	N. W.	4	29.870	56.4	49.7	C. K.	8	N. W.	7	
6	29.675	52.9	49.4	C. K.	9	S. W.	1	29.922	51.9	47.9	C. K.	8	N. W.	3	
9	29.748	50.9	47.4	C. K.	10	N. W.	4	29.960	46.9	45.4	C. K.	9	N. W.	2	
Means	29.652	51.4	48.1	. .	8.1	. .	2.9	29.848	48.4	45.2	. .	5.5	. .	3.1	
OCTOBER 15								OCTOBER 16							
0	29.988	46.4	45.4	C. K.	10	N. W.	2	29.947	49.9	48.4	C. K.	10	S.	3	
3	29.986	44.9	43.4	C. K.	7	N. W.	2	29.906	50.9	49.9	N.	10	S.	3	
6	30.017	42.4	40.4	C. K. S.	5	N. W.	1	29.922	51.4	49.9	C. K.	10	S. W.	2	
9	30.035	47.4	42.9	C. K.	6	S. W.	2	29.954	53.9	52.4	C. K.	10	S. W.	2	
12	30.016	57.9	50.4	C. K.	8	S. E.	3	29.949	63.9	54.9	C. K.	8	N. W.	6	
3	29.948	56.4	50.2	C. K.	10	S. W.	4	29.920	68.9	57.9	C. K.	2	S. W.	4	
6	29.972	52.9	48.4	C. K.	10	S. E.	8	29.921	56.4	51.4	C. K.	10	S.	1	
9	29.967	49.4	47.4	C. K.	7	S. E.	3	29.924	51.4	47.9	C. K.	6	S., S. W.	1	
Means	29.991	49.7	46.1	. .	7.9	. .	3.1	29.930	55.8	51.6	. .	8.2	. .	2.8	
OCTOBER 17								OCTOBER 18							
0	29.914	51.4	39.4	C. K.	10	S.	1	30.121	45.9	42.9	Clear	0	N. W.	4	
3	29.859	49.9	48.4	C. K.	10	S. W.	2	30.151	41.9	40.9	Clear	0	N. W.	2	
6	29.919	49.9	47.4	S.	1	N. W.	5	30.198	38.9	37.9	C. K.	2	N. W.	1	
9	29.964	54.9	49.9	Clear	0	N. W.	6	30.229	49.9	45.4	C. K.	6	N. W.	2	
12	29.952	61.4	52.7	C. K.	6	N. W.	2	30.203	57.4	49.4	C. K.	10	N. W.	1	
3	29.952	62.9	53.2	C. K.	5	N.	6	30.186	56.9	49.4	C. K.	10	N. W.	6	
6	30.019	54.9	48.4	C. K.	3	N. W.	3	30.188	52.4	48.4	C. K. S.	6	W., N. W.	1	
9	30.091	48.4	44.9	Clear	0	N. W.	2	30.188	49.9	48.4	N.	10	N. W.	1	
Means	29.959	54.2	48.0	. .	4.4	. .	3.4	30.183	49.2	45.3	. .	5.5	. .	2.2	
OCTOBER 19								OCTOBER 20							
0	30.160	49.4	48.4	K.	10	W.	1	29.732	61.4	60.9	N.	10	S. W.	1	
3	30.118	48.4	47.4	K.	10	S. W.	1	29.714	55.9	54.9	N.	10	N. W.	1	
6	30.045	48.4	47.4	C. K. S.	10	S.	2	29.762	50.4	48.9	N.	10	N. W.	1	
9	30.005	55.4	51.9	C. K.	2	S.	2	29.799	51.9	46.9	Clear	0	N. W.		
12	29.887	68.9	59.6	C. K.	2	S., S. W.	2	29.823	59.4	49.4	C. K.	2	N. W.	6	
3	29.800	75.2	64.6	C. K.	2	S. W.		29.841	55.2	55.2	C. K.	8	N. W.	10	
6	29.726	68.9	62.9	C. K.	9	S.	2	29.907	46.9	43.4	C. K.	2	N. W.	11	
9	29.774	62.4	61.4	N.	10	S. W.	2	29.979	42.4	39.9	C.	1	N. W.	3	
Means	29.939	59.6	55.4	. .	6.9	. .	1.7	29.820	52.9	49.9	. .	5.4	. .	4.7	

OCTOBER 21								OCTOBER 22							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.035	41.4	39.4	C. K.	2	N. W.	2	30.280	36.9	35.9	C. K.	3	N. W.	1	
3	30.081	37.4	35.9	C. K.	1	N. W.	1	30.289	35.9	34.9	C. K.	10	N. W.	1	
6	30.125	35.4	33.9	S.	1	W.	2	30.296	35.4	34.4	C. K.	10	N. W.	1	
9	30.166	45.4	39.4	C. K.	2	N. W.	3	30.305	40.4	37.9	C. K.	10	N. W.	2	
12	30.185	51.8	42.2	C. K.	4	N. W.	8	30.256	48.8	44.0	C. K.	8	S. W.	2	
3	30.182	53.4	44.7	C. K.	3	N. W.	6	30.166	51.9	46.9	C. K.	8	S. W.	5	
6	30.226	45.9	41.4	C. K.	2	N. W.	2	30.137	49.9	46.9	C. K.	10	S.	1	
9	30.262	39.9	37.4	C. K.	1	N. W.	1	30.152	47.4	46.4	N.	10	S.	1	
Means	30.158	43.8	39.3	. .	2.0	. .	3.1	30.235	43.3	40.9	. .	8.6	. .	1.8	
OCTOBER 23								OCTOBER 24							
0	30.096	46.9	46.4	N.	10	S.	1	29.751	57.4	56.9	K.	10	S.	1	
3	30.058	46.9	46.4	K.	10	S.	2	29.708	56.9	56.4	N.	10	S.	1	
6	30.009	48.9	48.4	N.	10	S.	1	29.864	56.4	55.9	N.	10	N. W.	5	
9	29.999	51.4	50.9	N.	10	S., S. W.	2	29.849	55.6	50.2	C. K.	8	N. W.	8	
12	29.942	54.2	53.2	N.	10	S.	2	29.942	56.4	47.9	C. K.	8	N. W.	6	
3	29.900	55.9	55.4	N.	10	S.	1	29.985	59.0	54.2	C. K.	4	N. W.	8	
6	29.854	56.9	56.4	N.	10	S. E.	2	30.023	50.9	46.4	C. K. S.	3	N. W.	0	
9	29.823	56.9	56.4	N.	10	S., S. E.	1	30.062	46.4	42.9	Clear	0	N. W.	1	
Means	29.960	52.2	51.7	. .	10.0	. .	1.5	29.898	54.9	51.4	. .	6.6	. .	3.8	
OCTOBER 25								OCTOBER 26							
0	30.084	42.4	40.9	C.	1	N. W.	2	30.216	50.9	48.9	C. K.	10	S. E.	1	
3	30.114	40.4	39.4	C. K.	1	N. W.	2	30.190	50.4	48.4	C. K.	10	S. E.	1	
6	30.172	38.4	37.9	C. K. S.	1	N. W.	2	30.222	49.9	48.4	C. K.	10	N. E.	1	
9	30.225	45.4	44.4	C. K.	3	S. W.	1	30.294	49.4	48.9	N.	10	N. E.	2	
12	30.215	58.0	51.9	C. K.	10	S. E.	1	30.276	50.9	49.9	N.	10	S. E.	2	
3	30.189	58.2	53.2	C. K.	10	S. W.	2	30.219	52.4	50.9	C. K.	10	E.	4	
6	30.178	53.9	50.9	C. K.	10	S. E.	2	30.198	52.4	51.9	N.	10	E.	2	
9	30.214	52.9	49.9	C. K.	10	S. E.	1	30.166	51.4	50.9	N.	10	E., S. E.	8	
Means	30.174	48.7	46.1	. .	5.8	. .	1.6	30.223	51.0	49.8	. .	10.0	. .	2.6	
OCTOBER 27								OCTOBER 28							
0	30.108	51.4	50.9	N.	10	E.	4	29.927	53.9	53.4	C. K.	10	S. W.	1	
3	30.063	50.9	49.9	N.	10	N. E.	5	29.885	53.9	53.4	C. K.	10	S.	1	
6	30.035	51.4	50.9	N.	10	N. E.	6	29.878	54.9	54.4	C. K.	10	S., S. E.	1	
9	30.021	55.8	54.9	N.	10	N. E.	4	29.858	56.9	56.4	C. K.	10	S. W.	1	
12	29.987	59.4	58.9	N.	10	N. E.	2	29.828	57.4	56.9	C. K.	10	S. W.	1	
3	29.917	62.4	61.4	C. K.	10	N. E.	2	29.848	51.4	48.9	C. K.	10	N. W.	10	
6	29.902	58.9	58.4	K.	10	N. W.	1	29.942	48.9	43.9	S.	1	N. W.	3	
9	29.948	55.9	55.4	C. K.	9	N. W.	5	29.979	45.4	42.9	Clear	0	N. W.	2	
Means	29.998	55.8	55.1	. .	9.9	. .	3.6	29.893	52.8	51.3	. .	7.6	. .	2.5	

OCTOBER 29								OCTOBER 30							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.013	43.4	41.9	Clear	0	N. W.	2	29.971	43.4	41.4	C. K.	2	S. W.	2	
3	30.013	43.9	41.4	Clear	0	N. W.	3	30.013	43.4	41.4	C. K.	2	S. W.	1	
6	30.023	44.9	39.4	C. K. S.	6	N. W.	7	30.117	42.4	39.9	C. K.	2	N. W.	1	
9	30.047	48.9	41.9	Clear	0	N. W.	12	30.186	57.4	52.8	Clear	0	N. W.	4	
12	29.995	57.2	47.2	C. K.	2	W., N. W.	6	30.208	54.2	44.9	Clear	0	N. W.	8	
3	29.892	60.9	49.9	C. K.	2	S. W.	4	30.201	56.9	47.6	Clear	0	N. W.	4	
6	29.865	51.4	45.9	C. K.	3	S. W.	2	30.230	49.4	43.4	Clear	0	N.	1	
9	29.907	46.4	43.9	Clear	0	S. W.	2	30.269	41.4	39.4	Clear	0	N. W.	1	
Means	29.969	49.6	43.9	. .	1.6	. .	4.8	30.149	48.6	43.8	. .	0.8	. .	2.8	
OCTOBER 31								NOVEMBER 1							
0	30.271	37.4	36.9	Clear	0	N. W.	2	30.228	48.4	46.4	C. K.	3	S. W.	3	
3	30.284	36.4	35.9	Clear	0	N. W.	1	30.230	46.4	45.4	C. K.	2	S. W.	2	
6	30.297	36.4	35.9	Clear	0	S. W.	1	30.258	43.4	42.4	C. K.	2	S. W.	1	
9	30.311	42.9	41.9	C. K.	3	S. E.	2	30.293	49.3	48.2	Clear	0	S.	1	
12	30.278	61.4	53.9	Clear	0	S. E.	8	30.257	67.4	58.9	Clear	0	S. E.	5	
3	30.215	63.6	55.0	C. K.	4	S.	8	30.203	72.0	60.9	Clear	0	S.	4	
6	30.218	56.4	51.4	C. K.	6	S.	3	30.206	61.9	56.9	Clear	0	S.	1	
9	30.240	52.9	49.9	C. K.	7	S. W.	2	30.214	53.4	51.4	Clear	0	S. W.	1	
Means	30.264	48.4	45.1	. .	2.5	. .	3.4	30.236	55.3	51.3	. .	0.9	. .	2.2	
NOVEMBER 2								NOVEMBER 3							
0	30.201	52.4	50.9	Clear	0	S. W.	1	29.873	61.3	56.9	C. K.	9	S. W.	6	
3	30.169	50.4	48.9	Clear	0	S.	1	29.814	57.9	55.4	C. K.	5	S.	2	
6	30.156	49.4	48.4	C. S.	3	S.	1	29.761	56.9	54.9	C. K.	9	S.	2	
9	30.143	56.9	54.9	C. K.	2	S.	2	29.757	62.4	59.4	C. K.	9	S., S. W.	2	
12	30.082	73.4	65.4	C. K.	2	S. W.	4	29.772	66.4	62.4	C. K. N.	10	N. W.	3	
3	29.998	72.9	63.4	C. K.	2	S. W.	8	29.814	65.4	54.9	C. K.	7	N., N. W.	5	
6	29.928	64.4	58.9	C. K.	9	S.	5	29.888	58.4	49.9	C. K.	5	N. W.	5	
9	29.912	62.4	57.9	C. K.	6	S.	7	30.023	49.9	45.9	C. K.	2	N. W.	1	
Means	30.074	60.3	56.1	. .	3.0	. .	3.6	29.838	59.8	55.0	. .	7.0	. .	3.2	
NOVEMBER 4								NOVEMBER 5							
0	30.070	46.9	42.4	Clear	0	N. W.	6	30.201	46.4	43.9	Clear	0	S.	1	
3	30.112	42.9	41.4	Clear	0	N. W.	2	30.185	45.9	43.9	C. K.	4	S. E.	1	
6	30.169	39.9	38.9	Clear	0	N. W.	1	30.193	46.4	45.4	C. K. S.	10	E.	1	
9	30.226	45.4	42.4	C. K.	1	W.	1	30.225	51.9	49.9	C. K.	5	S. E.	2	
12	30.217	63.9	52.9	Clear	0	S.	1	30.185	60.9	55.4	C. K.	9	S. E.	4	
3	30.156	63.9	52.9	C. K.	3	S.	3	30.124	63.4	58.4	C. K.	5	S.	2	
6	30.188	53.9	50.9	C. K. S.	10	S., S. E.	4	30.106	59.4	56.9	C. K. S.	7	S.	1	
9	30.199	47.4	45.9	Clear	0	S. W.	1	30.085	55.4	53.4	Clear	0	S.	1	
Means	30.167	50.5	46.0	. .	1.8	. .	2.4	30.163	53.7	50.9	. .	5.0	. .	1.6	

NOVEMBER 6								NOVEMBER 7							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.055	52.4	51.4	C. K.	2	S.	1	29.882	60.9	58.4	C. K.	10	S. W.	2	
3	29.999	51.9	51.4	C. K.	2	S.	2	29.910	59.9	57.9	C. K.	10	S. W.	1	
6	29.999	53.9	53.4	C. K. S.	7	S.	2	29.948	59.4	57.9	C. K.	10	S. W.	1	
9	29.958	60.9	58.0	C. K.	4	S.	3	30.007	61.9	58.6	C. K.	10	N., N. E.	3	
12	29.896	72.4	64.4	C. K.	1	S.	6	30.042	65.6	58.0	C. K.	9	N. E.	4	
3	29.836	72.9	63.9	C. K.	1	S.	6	30.050	63.9	56.9	C. K.	10	N. E.	6	
6	29.832	65.9	60.9	C. K.	5	S. W.	4	30.078	58.4	52.4	C. K.	10	E.	5	
9	29.844	61.9	58.9	C. K.	10	S. W.	3	30.109	56.9	51.9	K.	10	E.	5	
Means	29.927	61.5	57.8	. .	4.0	. .	3.4	30.003	60.9	56.5	. .	9.9	. .	3.4	
NOVEMBER 8								NOVEMBER 9							
0	30.131	56.4	51.4	K.	10	E.	3	29.942	57.9	56.4	C. K.	10	E.	2	
3	30.129	54.4	50.9	K.	10	E.	4	29.874	62.9	61.9	C. K.	10	E.	4	
6	30.149	52.9	49.4	K.	10	E.	3	29.854	62.9	61.9	C. K.	10	S.	5	
9	30.173	52.4	50.4	N.	10	N. E.	2	29.860	65.4	64.4	C. K.	10	S.	6	
12	30.135	53.9	52.4	K.	10	S. E.	2	29.837	68.4	67.4	C. K.	10	S.	5	
3	30.093	55.9	54.4	N.	10	E.	7	29.795	67.4	66.9	N.	10	S.	4	
6	30.047	55.9	54.9	N.	10	E.	4	29.787	66.9	66.4	N.	10	S. W.	2	
9	30.006	55.9	55.4	C. K.	10	E.	3	29.764	66.9	66.4	N.	10	S.	4	
Means	30.108	54.7	52.4	. .	10.0	. .	3.5	29.839	64.8	64.0	. .	10.0	. .	4.0	
NOVEMBER 10								NOVEMBER 11							
0	29.714	67.9	67.4	K.	10	S.	4	29.645	46.4	41.9	Clear	0	N. W.	3	
3	29.674	67.9	67.4	K.	10	S.	3	29.687	44.4	42.4	Clear	0	N. W.	6	
6	29.646	67.4	66.4	K.	10	S.	2	29.750	43.4	40.9	C. K. S.	8	W., S. W.	2	
9	29.585	67.4	66.7	C. K.	10	S.	5	29.870	47.9	40.9	C. K.	3	N. W.	12	
12	29.487	67.4	66.6	N.	10	S. W.	6	29.944	51.4	42.9	C. K.	4	N. W.	15	
3	29.397	71.2	66.2	C. K.	9	S. W.	9	30.002	49.4	41.4	C. K.	2	N. W.	11	
6	29.484	59.9	51.4	C. K. S.	1	N. W.	11	30.044	44.9	39.4	Clear	0	N. W.	5	
9	29.593	50.9	45.4	Clear	0	N. W.	14	30.114	38.4	35.9	Clear	0	N. W.	0	
Means	29.572	64.9	62.2	. .	7.5	. .	6.8	29.882	45.8	40.7	. .	2.1	. .	6.8	
NOVEMBER 12								NOVEMBER 13							
0	30.126	37.9	35.9	Clear	0	N. W.	2	30.358	35.9	35.4	Clear	0	N. W.	2	
3	30.160	35.4	34.4	Clear	0	N. W.	2	30.371	34.9	34.4	Clear	0	N. W.	2	
6	30.174	33.6	32.4	Clear	0	N. W.	1	30.411	33.9	32.9	Clear	0	N. W.	3	
9	30.236	41.9	39.4	C. K.	8	N. W.	1	30.456	38.4	37.2	Clear	0	N.	3	
12	30.228	56.4	46.4	C. K.	5	W., S. W.	6	30.438	61.0	51.0	Clear	0	S.	1	
3	30.203	57.9	49.4	C. K.	1	W.	5	30.392	60.7	50.4	C. K.	2	S.	5	
6	30.246	50.4	43.4	C. K.	1	S.	2	30.393	50.4	45.4	C. K. S.	4	S.	1	
9	30.307	41.4	38.9	Clear	0	N. W.	2	30.389	45.9	44.9	Clear	0	S.	3	
Means	30.210	44.4	40.0	. .	1.9	. .	2.6	30.401	45.1	41.4	. .	0.8	. .	2.5	

NOVEMBER 14								NOVEMBER 15							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.413	42.4	41.4	C. K.	1	S.	1	30.033	52.9	51.4	N.	10	N. E.	4	
3	30.405	38.4	37.9	Clear	0	S.	1	29.904	54.4	52.4	N.	10	E.	8	
6	30.398	36.4	35.9	S.	1	S. W.	1	29.687	54.9	53.9	N.	10	N. E.	10	
9	30.381	38.4	37.9	Fog	10	S. W.	1	29.616	59.4	58.4	N.	10	N. E.	5	
12	30.358	54.9	50.9	C. K.	5	S. E.	2	29.597	55.9	54.4	C. K.	10	N. W.	5	
3	30.261	58.4	53.4	C. K.	10	S. E.	2	29.607	56.9	55.4	N.	10	N. W.	6	
6	30.207	56.4	52.9	C. K.	10	E.	3	29.687	54.4	53.4	K.	10	N. W.	4	
9	30.152	53.9	51.9	C. K.	10	N. E.	3	29.746	53.4	51.9	K.	10	N. W.	2	
Means	30.322	47.4	45.3	. .	5.9	. .	1.8	29.735	55.3	53.9	. .	10.0	. .	5.5	
NOVEMBER 16								NOVEMBER 17							
0	29.770	50.9	49.4	K.	10	N. W.	2	30.091	42.4	38.4	C. K.	2	N. W.	6	
3	29.778	48.9	47.9	C. K.	4	S.	1	30.122	37.4	34.4	C.	2	N. W.	5	
6	29.788	47.9	47.4	C. K.	4	S.	1	30.206	34.4	31.9	C. S.	3	N. W.	4	
9	29.802	52.4	51.9	C. K.	8	S.	2	30.286	39.4	34.4	C. K.	3	N. W.	5	
12	29.782	63.4	57.9	C. K.	9	S. E.	4	30.313	42.9	37.4	C. K.	2	N. W.	7	
3	29.813	54.4	52.4	N.	10	N. W.	9	30.310	45.9	38.4	C. K.	2	N. W.	8	
6	29.893	49.4	45.9	C. K. S.	7	N., N. W.	7	30.405	41.9	36.9	C. K.	9	W.	2	
9	29.969	46.9	43.9	C. K.	8	N. W.	3	30.459	38.4	34.4	C. K.	9	N.	3	
Means	29.824	51.8	49.6	. .	7.5	. .	3.6	30.274	40.3	35.8	. .	4.0	. .	5.0	
NOVEMBER 18								NOVEMBER 19							
0	30.520	37.2	33.4	C. K.	9	N. E.	5	30.350	40.4	39.4	N.	10	N. E.	6	
3	30.566	35.4	32.4	C. K.	9	N. E.	7	30.283	40.4	39.4	N.	10	N. E.	3	
6	30.602	33.4	29.9	C. K.	7	E.	7	30.201	43.4	42.4	N.	10	N. W.	3	
9	30.642	34.9	31.9	C. K.	9	N. E.	5	30.157	41.2	40.9	N.	10	N. W.	6	
12	30.576	46.9	41.4	C. K.	6	E.	7	30.113	43.4	42.9	C. K.	10	N. W.	6	
3	30.507	44.9	40.9	C. K.	10	E.	6	30.067	47.9	46.9	C. K.	10	N. W.	7	
6	30.483	44.4	40.9	C. K.	10	N. E.	5	30.056	44.4	43.4	C. K. S.	9	N. W.	4	
9	30.437	42.9	40.9	N.	10	N. E.	4	30.093	46.4	44.4	K.	10	N. W.	7	
Means	30.542	40.0	36.5	. .	8.8	. .	5.8	30.165	43.4	42.5	. .	9.9	. .	5.2	
NOVEMBER 20								NOVEMBER 21							
0	30.116	47.4	46.4	C. K.	10	N., N. W.	5	30.415	33.2	30.2	C. K.	7	N. E.	5	
3	30.162	45.9	43.9	C. K.	8	N. W.	7	30.433	28.4	26.9	C. K.	2	N. E.	4	
6	30.231	43.4	39.9	C. K. S.	9	N. W.	5	30.431	26.9	24.4	Clear	0	N.	5	
9	30.304	42.4	37.9	C. K.	3	N.	9	30.470	28.9	25.9	Clear	0	N.	6	
12	30.327	44.9	38.9	Clear	0	N. W.	11	30.454	40.4	32.4	Clear	0	N. E.	4	
3	30.336	44.9	38.4	Clear	0	N. W.	10	30.359	40.4	35.9	C. K.	4	E.	5	
6	30.379	39.9	35.4	C. K.	1	N. E.	4	30.359	34.4	32.4	S.	1	N. E.	5	
9	30.399	36.4	32.4	C. K.	8	N. E.	6	30.359	31.4	30.4	Clear	0	N. E.	3	
Means	30.282	43.2	39.2	. .	4.9	. .	7.1	30.410	33.0	29.8	. .	1.8	. .	4.6	

NOVEMBER 22								NOVEMBER 23							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.330	27.9	27.4	C. K.	2	N. E.	3	30.433	29.9	26.9	Clear	0	N.	6	
3	30.311	25.9	25.4	C. K.	1	N.	4	30.457	27.4	25.9	Clear	0	N.	6	
6	30.301	24.4	23.9	C. K.	1	N.	3	30.467	24.6	23.4	C. K.	1	N.	6	
9	30.343	28.0	25.9	C. K.	4	N.	6	30.517	26.9	24.9	C. K.	9	N. E.	6	
12	30.351	41.4	32.9	Clear	0	N. E.	5	30.526	34.9	31.2	C. K.	10	N.	6	
3	30.325	40.4	33.4	Clear	0	N.	7	30.496	34.9	31.9	C. K.	10	N. E.	6	
6	30.364	34.8	30.4	Clear	0	N.	1	30.473	33.9	32.4	K.	10	N. E.	5	
9	30.401	31.4	28.4	Clear	0	N.	5	30.473	30.9	29.4	Clear	0	N. E.	5	
Means	30.341	31.8	28.5	. .	1.0	. .	4.2	30.480	30.4	28.2	. .	5.0	. .	5.8	
NOVEMBER 24								NOVEMBER 25							
0	30.449	29.4	28.4	C. K.	9	N.	5	30.286	33.4	31.4	Clear	0	N.	7	
3	30.409	31.4	30.4	C. K.	10	N.	3	30.140	31.9	29.9	Clear	0	N. W.	9	
6	30.395	32.9	31.9	K.	10	N.	4	30.104	30.4	27.9	C. K.	8	N.	7	
9	30.383	34.6	31.9	C. K.	10	N. W.	6	30.103	33.4	30.4	C. K.	8	N.	8	
12	30.333	44.4	40.2	C. K.	10	N. E.	6	30.014	37.9	33.9	C. K.	10	N.	11	
3	30.260	41.9	37.9	C. K.	10	N.	6	29.926	38.7	33.7	C. K.	6	N.	16	
6	30.252	40.0	36.9	C. K.	10	N.	5	29.868	38.4	33.9	C. K.	10	N.	16	
9	30.236	36.9	34.9	C. K.	9	N.	7	29.801	35.4	32.9	C. S.	1	N.	18	
Means	30.340	36.4	34.1	. .	9.8	. .	5.2	30.030	34.9	31.8	. .	5.4	. .	11.5	
NOVEMBER 26								NOVEMBER 27							
0	29.699	33.4	32.4	K.	10	N.	13	29.451	34.4	32.4	C. K.	10	N. W.	12	
3	29.590	32.9	31.9	N.	10	N. W.	16	29.482	34.8	32.4	C. K.	10	N. W.	11	
6	29.496	30.9	29.4	Snow	10	N. W.	15	29.553	35.9	33.4	C. K.	10	N. W.	9	
9	29.510	29.9	29.2	Snow	10	N. W.	16	29.592	37.9	34.4	C. K.	10	N. W.	10	
12	29.393	30.9	29.9	Rain	10	N. W.	16	29.612	39.4	35.9	C. K.	10	N. W.	10	
3	29.390	31.9	30.9	Rain	10	N. W.	12	29.631	39.9	36.4	C. K.	10	N. W.	5	
6	29.394	33.0	31.4	N.	10	N. W.	15	29.659	38.4	36.4	K.	10	N. W.	3	
9	29.435	34.2	32.0	C. K.	10	N. W.	13	29.710	36.4	35.4	N.	10	N. W.	4	
Means	29.488	32.1	30.9	. .	10.0	. .	14.5	29.586	37.1	34.6	. .	10.0	. .	8.0	
NOVEMBER 28								NOVEMBER 29							
0	29.734	36.4	35.4	C. K.	10	N. W.	2	29.778	37.9	36.4	C. K.	10	N. W.	2	
3	29.745	35.9	34.9	K.	10	N. W.	1	29.756	37.9	36.4	C. K.	10	N. W.	4	
6	29.758	35.4	34.4	K.	10	N. W.	2	29.748	37.9	36.4	C. K.	10	N. W.	6	
9	29.778	37.6	35.4	C. K.	10	N. W.	2	29.774	38.9	36.4	K.	10	N. W.	6	
12	29.800	40.4	37.9	C. K.	10	N. W.	6	29.734	45.4	40.4	C. K.	9	N. W.	6	
3	29.782	39.4	37.4	C. K.	10	N. W.	5	29.710	45.4	39.2	C. K.	10	N. W.	5	
6	29.787	39.0	37.4	C. K.	10	N. W.	4	29.730	41.9	39.4	C. K.	10	N. W.	5	
9	29.802	38.4	36.9	C. K.	10	N. W.	4	29.748	41.4	38.9	K.	10	N. W.	5	
Means	29.773	37.8	36.2	. .	10.0	. .	3.2	29.747	40.8	37.9	. .	9.9	. .	4.9	

NOVEMBER 30								DECEMBER 1							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	29.763	39.9	37.4	K.	10	N. W.	6	29.835	42.4	39.2	C. K.	10	N. W.	1	
3	29.755	38.4	35.9	C. K.	7	N. W.	3	29.831	41.9	38.0	C. K.	10	N. W.	3	
6	29.769	37.4	35.4	C. K. S.	6	N. W.	2	29.849	41.9	37.4	C. K.	9	N. W.	6	
9	29.780	41.9	38.4	C. K.	3	N. W.	2	29.909	40.9	38.4	C. K.	8	N. W.	4	
12	29.796	48.9	42.9	C. K.	3	N. W.	6	29.908	42.9	37.4	C. K.	8	N. W.	8	
3	29.791	46.9	41.9	C. K.	8	N. W.	6	29.902	42.0	36.2	C. K.	4	N. W.	10	
6	29.795	44.6	40.6	C. K.	10	N. W.	2	29.977	36.4	32.4	C. K.	1	N. W.	6	
9	29.819	43.9	39.6	C. K.	10	N. W.	4	30.035	32.9	31.9	C. K.	9	N. W.	1	
Means	29.784	42.7	39.0	. .	7.1	. .	3.9	29.906	40.2	36.4	. .	7.4	. .	4.9	
DECEMBER 2								DECEMBER 3							
0	30.047	34.4	30.9	Clear	0	N. W.	8	30.013	31.4	29.9	K.	10	W.	3	
3	30.054	30.4	28.4	Clear	0	N. W.	3	30.006	34.9	32.9	C. K.	10	N. W.	8	
6	30.062	27.4	26.4	Clear	0	N. W.	2	29.999	34.4	31.4	K.	10	N. W.	5	
9	30.083	31.9	29.9	Clear	0	N. W.	2	30.030	34.9	31.4	C. K.	10	N. W.	8	
12	30.068	43.4	37.4	Clear	0	S. W.	2	30.039	36.0	32.4	C. K.	10	N. W.	6	
3	30.056	43.9	37.4	Clear	0	S. W.	3	30.004	35.9	31.9	C. K.	10	N. W.	6	
6	30.047	33.9	32.4	S.	1	S. W.	2	30.010	35.4	31.9	C. K.	10	N. W.	5	
9	30.012	32.4	31.9	K.	10	S. W.	1	30.004	31.4	29.4	C. K.	2	N. W.	1	
Means	30.054	34.7	31.8	. .	1.4	. .	2.9	30.013	34.3	31.4	. .	9.0	. .	5.2	
DECEMBER 4								DECEMBER 5							
0	29.970	29.9	27.9	C. K.	10	N. W.	2	29.752	33.4	32.4	K.	10	W.	1	
3	29.912	30.2	28.4	C. K.	4	N. W.	2	29.718	33.4	32.4	C. K.	4	S. W.	1	
6	29.844	30.4	28.9	C. K.	10	S.	2	29.704	32.4	31.9	Clear	0	S. W.	2	
9	29.855	33.4	31.4	C. K.	8	S.	2	29.688	35.9	35.9	C. K.	8	S. E.	2	
12	29.852	41.9	35.8	C. K.	4	N. W.	10	29.619	53.9	45.8	C. K.	3	S.	4	
3	29.844	44.2	36.9	Clear	0	N. W.	8	29.547	54.4	45.6	Clear	0	S.	6	
6	29.839	37.9	35.4	S.	1	N. W.	2	29.508	46.7	42.0	C. K.	1	S.	1	
9	29.809	33.4	31.4	Clear	0	N. W.	1	29.477	42.4	38.4	C. K.	3	S.	3	
Means	29.866	35.2	32.0	. .	4.6	. .	3.6	29.627	41.6	38.0	. .	3.6	.	2.5	
DECEMBER 6								DECEMBER 7							
0	29.542	46.3	40.4	Clear	0	N. W.	10	30.166	27.9	26.4	Clear	0	N. W.	1	
3	29.617	41.9	37.4	C. K.	3	N. W.	14	30.172	27.4	26.9	Clear	0	N. W.	1	
6	29.759	39.4	34.4	C. K.	7	N. W.	13	30.174	25.4	25.4	S.	1	N. W.	1	
9	29.905	37.4	32.9	C. K.	8	N. W.	15	30.179	29.9	27.9	C. K.	3	S.	2	
12	29.966	39.9	34.4	C. K.	6	N. W.	15	30.111	45.4	38.9	C. K.	1	S.	7	
3	30.025	38.4	33.4	C. K.	3	N. W.	13	30.017	47.0	39.8	C. K.	3	S.	5	
6	30.086	34.4	30.4	Clear	0	N. W.	11	30.035	39.9	35.9	C. K.	6	S.	2	
9	30.130	31.9	28.9	Clear	0	N. W.	6	30.031	38.9	34.9	C. K.	10	S.	3	
Means	29.879	38.7	34.0	. .	3.4	. .	12.1	30.111	35.2	32.0	. .	3.0	. .	2.8	

DECEMBER 8								DECEMBER 9							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.021	37.4	33.4	C. K.	5	S.	2	29.897	40.4	37.6	C. K.	10	S. E.	1	
3	30.051	33.9	31.4	C. K.	10	S.	1	29.845	39.4	36.4	C. K.	10	S. E.	1	
6	30.041	32.9	30.9	C. K.	10	N. W.	1	29.846	38.4	36.9	C. K.	10	N.	1	
9	30.081	34.4	32.9	C. K.	9	N.	1	29.844	40.9	38.9	C. K.	10	N. E.	2	
12	30.051	47.4	41.9	C. K.	8	S.	3	29.852	42.4	41.4	N.	10	N. W.	1	
3	29.997	51.2	43.4	C. K.	7	N. E.	2	29.855	42.9	41.4	K.	10	N. W.	2	
6	29.960	45.4	41.1	C. K.	10	S. E.	2	29.912	39.4	37.9	C. K.	4	N. W.	2	
9	29.952	41.4	37.9	C. K.	8	S. E.	1	29.943	35.9	34.4	C.	1	N. W.	2	
Means	30.019	40.5	36.6	. .	8.4	. .	1.6	29.874	40.0	38.1	. .	8.1	. .	1.5	
DECEMBER 10								DECEMBER 11							
0	29.962	35.4	34.4	Clear	0	N. W.	2	29.724	39.4	38.4	N.	10	N. E.	7	
3	29.974	35.9	35.4	K.	10	N. W.	2	29.657	38.9	37.9	N.	10	N. E.	5	
6	29.968	37.4	36.9	K.	10	N.	4	29.621	38.4	37.4	K.	10	N. W.	8	
9	29.980	39.2	36.9	K.	10	N. E.	3	29.593	37.4	36.4	C. K.	4	N. W.	9	
12	29.956	39.9	37.4	K.	10	E.	6	29.543	43.9	40.4	C. K.	9	N. W.	14	
3	29.875	41.9	39.4	K.	10	N. E.	6	29.517	46.9	41.9	C. K.	8	N. W.	18	
6	29.813	41.4	38.9	K.	10	N. E.	5	29.619	40.4	35.9	C. K.	8	N. W.	15	
9	29.792	40.9	38.9	K.	10	N. E.	9	29.671	38.8	34.3	Clear	0	N. W.	12	
Means	29.915	39.0	37.3	. .	8.8	. .	4.6	29.618	40.5	37.8	. .	7.4	. .	11.0	
DECEMBER 12								DECEMBER 13							
0	29.697	37.9	32.9	C. K.	9	N. W.	12	29.916	28.4	27.9	C.	4	N. W.	1	
3	29.758	36.9	32.4	K.	10	N. W.	9	29.894	28.4	27.9	K.	10	N., N. W.	2	
6	29.818	36.4	32.0	C. K.	7	N. W.	6	29.877	27.4	26.4	C. K.	6	N. W.	1	
9	29.890	35.4	30.4	C. K.	2	N. W.	12	29.819	29.2	27.4	C. K.	9	N. W.	3	
12	29.926	37.9	31.9	C. K.	2	N. W.	12	29.846	35.9	31.4	C. K.	9	N. W.	8	
3	29.908	37.9	32.4	C. K.	3	N. W.	7	29.845	34.4	31.4	C. K.	8	N. W.	11	
6	29.910	36.4	30.9	C. K.	10	N.	4	29.936	29.4	25.4	C. K.	4	N. W.	10	
9	29.928	30.9	29.4	C. K.	10	N. W.	1	30.018	25.4	22.9	C. K.	3	N. W.	11	
Means	29.854	36.2	31.5	. .	6.6	. .	7.9	29.894	29.8	27.6	. .	6.6	. .	5.9	
DECEMBER 14								DECEMBER 15							
0	30.036	22.9	20.9	Clear	0	N. W.	5	30.350	24.4	23.9	Clear	0	N. W.	4	
3	30.052	23.4	21.4	Clear	0	N. W.	5	30.419	21.0	18.4	Clear	0	N. W.	1	
6	30.096	23.9	21.9	Clear	0	N. W.	9	30.439	18.4	16.4	Clear	0	N. W.	2	
9	30.155	25.9	22.4	Clear	0	N. W.	7	30.474	21.9	20.4	C. K.	2	W.	2	
12	30.162	31.2	27.4	C. K.	3	W., N. W.	14	30.465	35.9	30.4	C. K.	3	S. W.	4	
3	30.184	31.9	27.4	Clear	0	N. W.	12	30.390	37.9	31.9	C. K.	3	S. E.	6	
6	30.256	28.6	27.9	Clear	0	N. W.	8	30.371	31.9	28.4	C. K.	9	S.	5	
9	30.376	25.9	23.9	Clear	0	N. W.	5	30.345	30.9	29.4	C. K.	10	S.	3	
Means	30.165	26.7	24.2	. .	0.4	. .	8.1	30.407	27.8	24.9	. .	3.4	. .	3.4	

DECEMBER 16								DECEMBER 17							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30.302	30.4	27.4	Clear	0	S., S. W.	5	29.763	50.9	49.9	N.	10	S. E.	5	
3	30.279	29.4	27.4	C. K.	3	S. W.	3	29.681	53.4	52.4	N.	10	S., S. E.	5	
6	30.251	29.4	27.9	C. S.	1	S.	2	29.593	52.4	51.9	N.	10	N. E.	3	
9	30.191	32.8	29.4	C. K.	9	S. E.	2	29.533	51.9	51.4	N.	10	N.	2	
12	30.099	46.9	41.4	C. K.	10	S. E.	7	29.401	53.9	53.4	N.	10	N.	7	
3	29.966	45.9	41.4	C. K.	10	S. E.	1	29.223	51.9	51.4	N.	10	N.	8	
6	29.906	43.4	40.9	K.	10	N. E.	3	28.988	49.4	48.4	N.	10	N.	13	
9	29.859	45.9	43.9	K.	10	S. E.	1	28.855	46.9	45.4	N.	10	N. W.	18	
Means	30.107	38.0	35.0	. .	6.6	. .	3.0	29.380	51.3	50.5	. .	10.0	. .	7.6	
DECEMBER 18								DECEMBER 19							
0	29.029	46.4	44.9	N.	10	N. W.	15	29.700	31.9	30.4	C. K.	8	N. W.	4	
3	29.176	42.9	37.4	C. K.	9	N. W.	18	29.742	30.9	29.9	C. K.	2	N. W.	7	
6	29.324	39.6	35.9	C. K.	7	N. W.	11	29.785	30.4	28.4	C. K.	8	N. W.	9	
9	29.437	38.9	34.9	C. K.	2	N. W.	11	29.870	30.0	26.9	C. K.	3	N. W.	11	
12	29.501	40.9	35.4	C. K.	2	N. W.	15	29.928	32.8	28.4	C. K.	9	N. W.	9	
3	29.566	41.4	35.9	C. K.	2	N. W.	9	29.953	33.4	29.4	C. K.	9	N. W.	9	
6	29.623	35.9	32.4	C. K. S.	4	N.	7	30.036	30.9	27.4	Clear	0	N. W.	6	
9	29.668	33.9	31.4	C. K.	10	N. W.	8	30.126	27.4	23.9	Clear	0	N. W.	5	
Means	29.416	40.0	36.0	. .	5.8	. .	11.8	29.892	31.0	28.1	.	4.9	. .	7.5	
DECEMBER 20								DECEMBER 21							
0	30.159	24.9	22.4	Clear	0	N. W.	8	30.048	22.9	21.4	Clear	0	W.	1	
3	30.196	23.4	21.9	Clear	0	N. W.	5	30.004	20.9	18.4	Clear	0	S.	1	
6	30.251	20.9	19.9	Clear	0	N. W.	6	29.936	20.4	18.4	C. K.	8	W.	0	
9	30.299	21.4	19.4	Clear	0	N., N. W.	2	29.910	23.4	21.4	C. K.	3	N. W.	1	
12	30.263	30.9	26.4	C. K.	2	N. W.	3	29.851	36.9	30.9	C. K.	1	N. W.	4	
3	30.191	32.9	28.4	C.	1	N. W.	3	29.832	35.9	31.9	C. K.	8	N. W.	13	
6	30.160	28.1	25.4	Clear	0	N. W.	0	29.912	33.9	30.9	C. K.	9	N. W.	9	
9	30.122	24.8	22.4	Clear	0	S.	1	30.037	26.4	23.4	C. K.	1	N. W.	13	
Means	30.205	25.9	23.3	. .	0.4	. .	3.5	29.941	27.6	24.6	. .	3.8	. .	5.2	
DECEMBER 22								DECEMBER 23							
0	30.130	21.9	19.4	Clear	0	N. W.	13	30.510	20.9	19.9	C. K.	2	S. W.	1	
3	30.211	17.4	15.4	Clear	0	N. W.	11	30.520	19.9	18.9	C. K.	2	S. W.	1	
6	30.314	15.9	13.4	Clear	0	N. W.	8	30.510	18.9	18.4	C. K.	2	S. W.	3	
9	30.436	17.4	14.9	Clear	0	N. W.	7	30.519	23.4	19.4	Clear	0	S.	2	
12	30.466	25.9	20.4	Clear	0	N. W.	8	30.456	40.9	31.9	Clear	0	S., S. E.	4	
3	30.464	29.9	23.9	C. K.	3	W.	4	30.397	40.9	33.4	C.	1	S.	2	
6	30.468	25.4	21.9	Clear	0	N. W.	1	30.352	34.4	31.9	Clear	0	S.	1	
9	30.502	22.4	20.9	Clear	0	N. W.	1	30.361	30.8	26.4	Clear	0	S.	1	
Means	30.374	22.0	18.8	. .	0.4	. .	6.6	30.453	28.8	25.0	. .	0.9	. .	1.9	

DECEMBER 24								DECEMBER 25							
CIVIL TIME	BAROM- ETER	THERMOM'S		CLOUDS		WIND		BAROM- ETER	THERMOM'S		CLOUDS		WIND		
		Dry	Wet	Form	Am't	Dir'n	Vel.		Dry	Wet	Form	Am't	Dir'n	Vel.	
h	in	°	°					in	°	°					
0	30. 316	27. 8	25. 4	Clear	0	S.	1	30. 242	27. 4	26. 4	Clear	0	S.	1	
3	30. 322	24. 4	21. 4	Clear	0	S.	1	30. 217	26. 9	26. 4	Clear	0	S.	1	
6	30. 307	22. 0	19. 4	Clear	0	S.	1	30. 203	24. 4	23. 4	Clear	0	S. W.	1	
9	30. 331	23. 4	21. 9	Fog	3	N. W.	1	30. 302	28. 9	27. 9	C. K.	2	W.	0	
12	30. 302	41. 9	35. 9	Clear	0	S. E.	4	30. 217	49. 4	43. 4	C. K.	2	S. E.	3	
3	30. 252	44. 9	38. 9	Clear	0	S. E.	4	30. 124	53. 4	45. 9	C. K.	2	S.	4	
6	30. 253	37. 9	33. 4	S.	1	S.	1	30. 184	45. 9	41. 9	C. K.	3	S. E.	1	
9	30. 253	29. 9	27. 4	Clear	0	S.	1	30. 190	38. 4	35. 9	C. K.	5	S. E.	4	
Means	30. 292	31. 5	28. 0	. .	0. 5	. .	1. 8	30. 210	36. 8	33. 9	. .	1. 8	. .	1. 9	
DECEMBER 26								DECEMBER 27							
0	30. 172	33. 9	32. 9	C. K.	5	S. E.	1	29. 818	51. 9	49. 9	C. K.	9	S.	7	
3	30. 152	33. 9	32. 9	C. K.	5	S. E.	1	29. 739	51. 1	49. 4	N.	10	S.	7	
6	30. 138	32. 9	31. 9	C. K.	7	S. W.	1	29. 659	50. 9	50. 4	K.	10	S.	3	
9	30. 156	34. 4	33. 4	C. K.	9	S.	1	29. 637	51. 9	50. 9	K.	10	S. W.	4	
12	30. 098	54. 9	48. 4	C. K.	8	S.	5	29. 551	56. 9	53. 9	C. K.	6	S.	7	
3	30. 010	58. 9	51. 9	C. K.	7	S.	5	29. 596	44. 4	41. 9	N.	10	N. W.	15	
6	29. 948	52. 4	48. 9	C. K.	3	S.	5	29. 734	38. 4	35. 4	S.	1	N. W.	10	
9	29. 918	48. 6	46. 9	C. K.	10	S.	3	29. 837	37. 4	31. 9	Clear	0	N. W.	9	
Means	30. 074	43. 7	40. 9	. .	6. 8	. .	2. 3	29. 696	47. 9	45. 5	. .	7. 0	. .	7. 8	
DECEMBER 28								DECEMBER 29							
0	29. 875	34. 9	33. 9	Clear	0	N. W.	5	30. 248	27. 4	26. 4	Clear	0	N. W.	2	
3	29. 938	35. 4	34. 4	C. K.	9	N. W.	9	30. 276	25. 9	25. 4	Clear	0	N. W.	2	
6	30. 004	33. 9	30. 9	C. K. S.	7	N. W.	8	30. 331	23. 9	23. 4	Clear	0	N. W.	2	
9	30. 110	37. 4	31. 4	C. K.	4	N. W.	9	30. 394	25. 4	23. 4	C.	1	W., S. W.	1	
12	30. 134	40. 6	34. 4	C. K.	1	N. W.	5	30. 397	43. 4	35. 9	C. K.	3	W.	1	
3	30. 134	41. 2	34. 4	Clear	0	N. W.	7	30. 389	45. 9	37. 4	C. K.	1	S., S. E.	4	
6	30. 177	35. 9	32. 4	Clear	0	W.	1	30. 421	37. 9	23. 4	C. K.	1	S., S. E.	1	
9	30. 221	30. 9	28. 9	Clear	0	W.	1	30. 457	31. 6	28. 4	C. K.	2	S. E.	3	
Means	30. 074	36. 3	32. 6	. .	2. 6	. .	5. 6	30. 364	32. 7	28. 0	. .	1. 0	. .	2. 0	
DECEMBER 30								DECEMBER 31							
0	30. 462	27. 4	24. 4	C. K.	2	N. W.	3	30. 299	35. 9	34. 9	Clear	0	S.	1	
3	30. 496	25. 9	23. 4	Clear	0	N. W.	2	30. 267	34. 9	33. 8	C. K.	10	S.	1	
6	30. 451	24. 4	21. 4	Clear	0	N. W.	2	30. 199	36. 9	36. 4	N.	10	S.	2	
9	30. 546	26. 9	25. 4	C. K.	2	N. W.	2	30. 128	40. 9	38. 4	N.	10	S.	1	
12	30. 510	43. 9	37. 4	C. K.	2	N. W.	1	30. 065	44. 4	42. 0	N.	10	S.	1	
3	30. 454	48. 4	41. 4	C. K.	2	S. W.	5	29. 997	46. 4	44. 9	C. K.	10	S.	0	
6	30. 418	41. 4	37. 4	C. S.	1	S.	2	29. 980	44. 4	43. 4	K.	10	S.	2	
9	30. 387	37. 4	35. 9	. .	0	S.	1	29. 980	42. 9	41. 9	C. K.	9	N. W.	2	
Means	30. 466	34. 5	30. 8	. .	1. 1	. .	2. 2	30. 114	40. 8	39. 5	. .	8. 6	. .	1. 2	

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

1888

TABLE 1.—*Daily and Monthly Means of the Corrected Readings of the Barometer.*

DAY	January	Feb'y	March	April	May	June	July	August	Septem.	October	Novem.	Decem.
	in	in	in	in	in	in	in	in	in	in	in	in
1	29.838	30.172	30.227	29.943	29.695	29.662	29.859	29.875	29.772	29.646	30.236	29.906
2	29.964	30.324	30.112	29.550	29.962	29.785	30.039	29.942	29.998	29.530	30.074	30.054
3	30.076	30.183	30.010	29.988	30.141	29.897	30.104	29.921	30.118	29.921	29.838	30.013
4	30.084	29.940	30.114	30.250	30.030	30.041	30.023	29.768	29.999	30.052	30.167	29.866
5	30.099	29.718	29.895	30.080	29.946	30.148	29.857	29.742	30.024	29.964	30.163	29.627
6	30.126	29.952	29.902	29.940	30.119	30.036	29.938	29.767	30.286	29.756	29.927	29.879
7	29.849	29.910	29.971	30.105	30.129	29.935	29.876	29.804	30.362	29.636	30.003	30.111
8	29.823	29.666	30.076	30.244	30.080	30.046	29.918	29.832	30.069	29.575	30.108	30.019
9	30.278	29.907	30.286	30.341	29.878	30.015	29.833	29.914	29.904	29.778	29.839	29.874
10	29.985	30.117	30.330	30.060	29.839	29.821	29.794	30.095	29.880	29.939	29.572	29.915
11	30.244	29.845	29.949	29.954	29.793	29.718	29.772	30.141	29.858	29.761	29.882	29.618
12	30.687	29.953	29.933	30.058	29.660	30.030	29.625	29.996	29.919	29.563	30.210	29.854
13	30.272	30.097	29.745	30.214	29.794	30.095	29.776	29.944	29.908	29.652	30.401	29.894
14	30.394	30.064	29.879	29.843	29.758	29.946	29.956	30.070	30.120	29.848	30.322	30.165
15	30.203	30.332	30.156	29.936	29.914	29.844	29.997	30.020	30.085	29.991	29.735	30.407
16	30.643	30.459	29.883	29.857	29.868	29.753	30.020	30.002	29.854	29.930	29.824	30.107
17	30.387	29.927	29.774	30.218	30.055	29.797	30.096	29.913	29.853	29.959	30.274	29.380
18	29.963	29.912	29.964	30.018	29.906	29.755	30.089	29.965	29.952	30.183	30.542	29.416
19	30.131	30.181	30.104	29.953	29.863	29.843	30.004	29.976	30.006	29.939	30.165	29.892
20	30.068	29.841	29.834	29.849	30.100	29.833	29.954	29.926	30.001	29.820	30.282	30.205
21	30.271	29.976	29.449	29.976	30.130	29.754	30.016	29.628	29.925	30.158	30.410	29.941
22	30.522	30.184	29.827	29.931	30.051	29.744	29.949	29.786	30.018	30.235	30.341	30.374
23	30.325	30.154	30.188	29.828	29.838	29.689	29.920	30.081	30.047	29.960	30.480	30.453
24	30.272	30.083	30.171	30.148	29.798	29.676	29.910	30.053	30.076	29.898	30.340	30.292
25	30.138	29.530	30.366	30.450	29.830	29.714	30.016	29.994	29.878	30.174	30.030	30.210
26	29.713	29.656	30.154	30.445	29.822	29.720	29.958	29.973	29.627	30.223	29.488	30.074
27	29.873	29.822	30.017	30.310	29.818	29.889	29.909	29.910	29.738	29.998	29.586	29.696
28	30.005	30.257	29.824	30.176	29.702	29.810	30.016	30.008	29.966	29.893	29.773	30.074
29	30.073	30.247	29.826	29.939	29.727	29.930	30.092	29.924	30.044	29.969	29.747	30.364
30	29.903	. .	30.122	29.748	29.855	29.964	29.996	29.882	30.000	30.149	29.784	30.466
31	29.876	. .	29.966	. .	29.747	. .	29.925	29.824	. .	30.264	. .	30.114
Means	30.132	30.014	30.002	30.045	29.898	29.863	29.943	29.925	29.976	29.915	30.051	30.008

in

Mean barometric pressure for the year 1888 29.981

Maximum mean daily pressure, January 12 30.687

Minimum mean daily pressure, December 17 29.380

Range of mean daily pressure 1.307

TABLE 2.—*Maximum and Minimum Corrected Readings of the Barometer for each Month.*

MONTH	MAXIMUM		MINIMUM		RANGE		
	Day and hour	Reading	Day and hour	Reading			
	d	h	in	d	h	in	in
January	12	12 noon	30. 762	26	3 a. m.	29. 597	1. 165
February	16	0 a. m.	30. 584	25	3 p. m.	29. 396	1. 188
March	25	9 a. m.	30. 424	21	12 noon	29. 291	1. 133
April	25	9 a. m.	30. 514	2	6-9 a. m.	29. 466	1. 048
May	3	9 a. m.	30. 206	12	3 p. m.	29. 586	0. 620
June	5	12 noon	30. 193	1	3 a. m.	29. 567	0. 626
July	3	9 a. m.	30. 158	21	9 p. m.	29. 575	0. 583
August	11	6 a. m.	30. 170	21	9 p. m.	29. 375	0. 795
September	7	9 a. m.	30. 411	26	3 p. m.	29. 583	0. 828
October	31	9 a. m.	30. 311	12	3 a. m.	29. 395	0. 916
November	18	9 a. m.	30. 642	26	3 p. m.	29. 390	1. 252
December	30	9 a. m.	30. 546	17	9 p. m.	28. 855	1. 691

	in
Maximum for the year	30.762
Minimum for the year	28.855
Range for the year	1.907
Mean monthly range	0.987

TABLE 3.—Daily and Monthly Mean Temperatures from the Dry-bulb Thermometer.

DAY	January	Feb'y	March	April	May	June	July	August	Septem.	October	Novem.	Decem.
	°	°	°	°	°	°	°	°	°	°	°	°
1	35.2	33.3	40.0	52.1	63.0	65.9	70.8	77.0	72.6	57.3	55.3	40.2
2	33.6	28.6	41.2	61.2	51.3	62.5	67.2	76.5	70.1	57.6	60.3	34.7
3	31.3	30.3	41.7	53.2	51.7	60.2	69.0	76.3	64.3	46.1	59.8	34.3
4	35.0	34.2	31.3	50.3	59.8	61.6	73.6	81.9	66.2	48.7	50.5	35.2
5	37.3	39.6	25.3	53.2	67.3	66.4	76.7	80.7	70.8	57.6	53.7	41.6
6	34.2	37.3	20.3	63.8	64.9	73.6	76.7	81.6	61.4	61.4	61.5	38.7
7	38.9	34.2	26.2	55.1	67.2	71.9	80.0	83.0	57.2	56.1	60.9	35.2
8	44.8	35.0	35.0	44.5	64.0	63.9	76.7	80.4	62.8	53.4	54.7	40.5
9	33.9	28.6	37.6	45.5	68.3	69.3	74.0	78.4	71.3	46.0	64.8	40.0
10	34.5	16.7	38.6	50.2	69.5	71.9	68.1	74.2	67.9	46.6	64.9	39.0
11	27.3	23.7	38.6	55.7	66.5	70.3	74.1	73.6	62.7	45.5	45.8	40.5
12	19.7	31.7	24.5	50.5	69.5	65.7	78.0	75.0	70.2	49.8	44.4	36.2
13	30.2	31.2	16.4	41.3	63.6	66.5	65.5	70.0	66.0	51.4	45.1	29.8
14	33.6	33.4	23.9	50.2	55.6	72.1	68.0	69.4	61.0	48.4	47.4	26.7
15	37.9	30.1	35.7	46.8	50.2	77.4	70.4	76.7	64.8	49.7	55.3	27.8
16	25.2	20.6	40.8	45.6	54.5	78.9	70.8	82.5	70.5	55.8	51.8	38.0
17	22.4	36.8	39.7	46.5	54.1	77.3	70.8	80.2	70.6	54.2	40.3	51.3
18	26.5	38.3	34.3	53.5	55.1	79.8	70.8	77.0	69.9	49.2	40.0	40.0
19	19.7	38.5	42.0	51.0	61.7	78.3	72.2	72.2	68.9	59.6	43.4	31.0
20	21.8	50.8	51.2	47.2	56.8	74.9	74.5	73.7	68.0	52.9	43.2	25.9
21	21.3	48.3	54.9	42.1	56.9	79.3	73.6	76.7	68.0	43.8	33.0	27.6
22	14.2	41.3	33.4	46.8	58.8	81.4	74.8	68.6	62.8	43.3	31.8	22.0
23	23.2	40.1	24.4	48.2	58.9	80.8	76.3	63.3	62.0	52.2	30.4	28.8
24	27.0	37.7	30.5	44.3	60.2	82.0	77.2	69.2	60.6	54.9	36.4	31.5
25	21.4	48.1	32.9	44.8	61.8	81.1	73.8	70.4	56.4	48.7	34.9	36.8
26	24.6	42.7	34.4	52.5	62.5	79.0	73.9	73.5	59.9	51.0	32.1	43.7
27	20.0	27.7	43.8	61.3	66.9	73.0	73.4	72.3	59.7	55.8	37.1	47.9
28	12.5	20.2	48.9	63.6	72.2	68.7	71.2	66.9	55.0	52.8	37.8	36.3
29	17.9	30.0	48.7	69.8	77.9	59.8	70.2	66.4	48.3	49.6	40.8	32.7
30	27.9	. .	48.0	70.8	71.0	67.0	68.8	72.3	48.5	48.6	42.7	34.5
31	31.7	. .	57.3	. .	65.0	. .	75.5	73.2	. .	48.4	. .	40.8
Means	27.9	34.1	36.8	52.1	62.2	72.0	72.8	74.6	63.9	51.5	46.7	35.8

Mean temperature for the year 1888 by the dry-bulb thermometer 52.5
 Maximum mean daily temperature, August 7 83.0
 Minimum mean daily temperature, January 28 12.5
 Range of mean daily temperature 70.5

TABLE 4.—*Temperatures from the Maximum and Minimum Thermometers.*

DAY	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
1	42.3	30.0	38.2	23.5	50.2	31.5	62.2	41.5	69.9	49.0	73.7	55.0
2	40.7	26.0	39.2	19.8	44.7	36.5	77.7	45.0	60.7	44.0	71.2	51.0
3	40.7	23.0	41.9	19.0	51.7	31.0	62.5	41.5	64.8	37.0	69.2	51.0
4	40.7	25.0	35.7	31.5	37.7	23.0	63.2	39.0	73.3	48.5	73.7	48.5
5	42.2	32.0	50.9	32.5	31.2	16.5	67.7	44.0	81.2	56.0	81.7	50.0
6	37.2	30.5	41.7	32.9	31.7	8.0	68.9	48.0	78.9	47.5	89.2	58.0
7	48.7	30.0	36.7	31.0	38.2	13.0	65.2	46.5	80.0	51.8	78.9	57.0
8	50.7	39.0	42.7	27.0	44.7	24.0	54.7	33.5	69.7	59.0	73.7	52.5
9	40.2	29.5	33.7	20.0	49.2	28.0	.	.	79.2	58.5	81.7	56.0
10	42.2	29.0	22.2	12.5	53.0	25.0	59.2	42.0	76.6	63.5	88.3	62.6
11	34.2	15.0	31.7	12.5	47.2	27.5	64.7	44.5	71.2	62.5	80.2	60.0
12	28.9	11.5	34.7	29.0	29.7	15.5	66.9	37.0	81.9	62.5	76.2	52.5
13	33.7	23.2	41.2	20.5	19.7	11.3	53.2	30.5	73.3	50.0	78.9	53.0
14	45.7	25.0	49.9	19.0	36.7	11.5	65.2	40.0	65.2	48.0	87.7	60.0
15	45.7	31.0	44.7	15.0	47.7	26.0	57.7	35.5	57.7	43.5	91.3	64.0
16	32.7	18.8	30.2	10.0	63.2	29.2	55.2	39.0	63.6	45.5	9.7	67.0
17	26.7	17.5	53.7	21.0	45.7	28.5	58.7	33.0	65.2	41.0	89.2	67.0
18	31.7	19.0	50.5	28.0	46.7	23.0	72.5	40.0	60.2	50.0	91.7	68.0
19	25.7	15.0	52.2	26.0	60.2	26.5	61.2	43.0	69.7	52.0	86.7	66.5
20	31.7	10.0	59.7	41.0	57.9	44.5	54.2	37.0	66.1	47.0	88.7	59.0
21	29.2	11.5	55.7	33.5	65.7	38.0	50.7	32.6	66.7	45.0	92.7	67.0
22	19.8	7.0	57.7	28.5	40.2	16.0	56.7	38.5	66.2	48.5	93.7	70.2
23	26.7	18.0	52.7	32.5	34.7	14.5	56.7	40.0	62.2	57.0	94.7	71.5
24	33.2	19.0	46.2	26.6	35.2	24.5	53.7	34.8	63.7	57.5	94.7	72.0
25	28.7	14.0	56.7	38.5	36.7	29.0	56.7	31.5	67.7	57.0	91.2	71.0
26	32.2	17.0	50.2	30.0	38.2	30.5	67.7	35.2	71.7	56.0	86.4	69.0
27	28.2	11.0	32.5	14.0	50.7	35.5	80.9	41.0	79.7	59.0	78.7	68.0
28	19.3	6.2	30.2	12.0	55.7	42.0	81.5	44.9	85.7	62.0	75.7	58.5
29	29.9	6.0	35.7	21.0	53.2	35.0	87.2	53.0	87.2	66.5	65.2	54.0
30	37.2	22.5	.	.	62.7	31.0	85.2	56.0	79.2	65.5	78.2	59.0
31	36.1	24.8	.	.	74.9	41.5	.	.	69.2	61.5	.	.
Means	34.9	20.5	43.1	24.4	46.3	26.4	64.4	40.3	71.2	53.3	83.2	60.6
Mean of max. and min.	27°.7		33°.8		36°.4		52°.4		62°.2		71°.9	

TABLE 4.—*Temperatures from the Maximum and Minimum Thermometers—Continued.*

DAY	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
1	77.4	58.0	84.2	69.0	78.9	67.0	71.7	45.2	72.2	40.0	43.7	31.0
2	78.2	55.5	86.5	66.0	80.3	61.5	65.7	43.5	74.7	47.5	46.2	26.5
3	80.7	56.0	89.0	63.4	76.2	56.0	54.7	39.0	68.7	45.0	36.9	26.0
4	86.9	60.0	95.3	70.0	70.7	60.0	63.3	34.5	65.7	39.0	45.2	28.0
5	89.2	68.5	91.2	72.0	81.2	62.5	72.7	43.5	65.7	44.0	56.7	31.0
6	86.7	67.0	90.7	73.0	65.7	54.5	71.7	54.0	74.7	50.5	46.7	28.5
7	91.5	67.0	93.5	72.0	60.1	52.5	65.0	46.5	66.7	55.0	49.2	24.5
8	84.9	67.2	97.6	70.4	67.7	56.5	60.7	46.5	56.7	50.0	50.7	30.0
9	79.7	67.0	88.2	71.0	78.2	66.0	56.7	37.0	69.2	56.5	44.7	34.5
10	73.7	63.3	84.7	63.6	70.2	59.0	60.7	34.8	72.2	45.0	42.2	36.0
11	87.2	62.5	84.7	60.0	64.7	59.0	50.2	41.0	51.7	36.0	49.7	36.0
12	88.2	62.5	89.2	67.0	85.5	56.5	58.2	44.0	59.2	32.0	38.7	28.5
13	75.5	54.0	78.2	62.0	74.2	54.5	63.2	43.0	62.2	31.0	36.2	21.5
14	78.2	57.0	81.4	58.0	73.7	48.0	56.7	39.0	58.7	34.0	32.9	20.6
15	81.7	59.0	91.2	64.5	75.7	54.0	61.2	41.5	60.2	49.0	40.7	16.5
16	81.8	59.2	94.5	72.0	79.7	62.4	69.7	49.0	64.2	40.0	50.7	26.0
17	80.7	59.0	90.5	71.5	73.8	65.0	63.2	44.5	50.2	32.8	54.3	43.5
18	81.9	58.5	85.2	70.0	79.5	62.5	58.2	37.5	46.7	31.0	46.7	31.0
19	76.2	67.2	78.2	66.0	79.2	59.0	75.2	47.0	48.2	38.0	34.7	23.5
20	82.2	67.0	80.7	67.5	80.2	56.0	61.7	40.0	48.7	31.5	36.2	18.0
21	83.2	63.5	82.9	67.5	76.7	56.5	53.7	34.5	42.2	24.5	38.7	18.5
22	85.2	64.0	76.2	56.0	74.9	52.4	53.7	34.0	43.9	22.2	31.2	14.5
23	89.7	63.0	75.7	52.0	71.2	54.5	57.2	46.5	36.7	22.0	42.9	12.0
24	89.2	68.5	84.2	54.0	65.5	54.0	59.7	41.0	45.2	28.0	47.7	19.5
25	83.7	63.0	87.2	55.5	61.7	52.0	59.2	38.0	39.7	29.5	54.9	23.5
26	86.2	62.5	89.6	58.0	73.7	48.5	53.2	47.5	34.7	28.0	59.7	29.5
27	81.2	64.5	83.2	65.5	70.2	48.0	61.7	50.0	40.7	34.0	61.2	34.0
28	79.7	62.0	77.2	55.0	63.9	44.0	58.2	43.0	41.3	34.0	42.2	26.0
29	77.2	63.5	82.2	51.5	55.7	41.0	61.3	39.5	46.7	35.5	49.1	20.5
30	71.2	65.0	85.1	60.5	60.2	38.0	57.2	37.5	49.9	35.0	50.5	21.5
31	87.1	67.8	81.9	66.5	. .	. .	64.7	35.0	. .	. .	46.2	34.0
Means	82.5	62.7	85.8	64.2	72.3	55.4	61.3	41.9	55.2	37.4	45.4	26.3
Means of max. and min.	72°.6		75°.0		63°.8		51°.6		46°.3		35°.8	

Mean temperature for the year 1888 from the maximum and minimum thermometers . . . 52.9
 Maximum temperature during the year, August 8 97.6
 Minimum temperature during the year, January 29 6.0
 Range during the year 91.6

TABLE 5.—*Maximum and Minimum Temperatures for each Month.*

MONTH	MAXIMUM		MINIMUM		RANGE
	Day	Temp.	Day	Temp.	
	d	°	d	°	°
January	8	50.7	29	6.0	44.7
February	20	59.7	16	10.0	49.7
March	31	74.9	6	8.0	66.9
April	29	87.2	13	30.5	56.7
May	29	87.2	3	37.0	50.2
June	23, 24	94.7	4	48.5	46.2
July	7	91.5	13	54.0	37.5
August	8	97.6	29	51.5	46.1
September	12	85.5	30	38.0	47.5
October	19	75.2	22	34.0	41.2
November	2, 6	74.7	23	22.0	52.7
December	27	61.2	23	12.0	49.2

TABLE 6.—*Amount of Rain and Snow for each Month.*

MONTH	RAIN AND MELTED SNOW	DEPTH OF SNOW
	in	in
January	2.842	. .
February	2.979	. .
March	5.044	. .
April	1.568	. .
May	4.992	. .
June	3.282	. .
July	4.334	. .
August	3.242	. .
September	6.414	. .
October	3.424	. .
November	2.676	. .
December	3.268	. .
Total	44.065	. .

APPENDIX 1

OBSERVATIONS
OF
DOUBLE STARS

MADE AT THE
UNITED STATES NAVAL OBSERVATORY

PART SECOND

1880-1891

BY

ASAPH HALL

PROFESSOR OF MATHEMATICS, U. S. NAVY

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INTRODUCTION.

§ 1.

The following observations of double stars have been made in continuation of the work begun with the 26-inch equatorial sixteen years ago. The stars observed are mostly known binaries. Some of these are of special interest on account of their short periods, and some of them are of very slow motion. This last class of stars has been observed with the view of connecting my own measurements with those of other astronomers. The formulæ and corrections for personal errors of observation which have been deduced and applied by some astronomers seem to me of doubtful utility, and a better way, I think, is to compare the measurements of the same stars by different observers. Observations made at different epochs of pairs having very slow motions may be reduced and compared, and we may in this way, perhaps, obtain a sure method of reducing all the observations to a common standard. A few wide double stars which have large proper motions have also been observed, and a few pairs which were supposed to have some special interest have been observed at the request of various astronomers. Some new pairs have been discovered by Mr. GEORGE ANDERSON, assistant in the dome, and these have been observed, but no systematic attempt has been made to discover new double stars.

§ 2.

A few years after this instrument was mounted, the labor of turning the dome by the hand windlass became very great, and was the chief difficulty in observing. This trouble was caused by the unequal spreading of the dome, which became of a slightly oval form. To overcome this a small gas engine was placed in the cellar in 1884 and connected by two upright shafts with the cog work at the base of the dome. This engine has performed well, and the labor of moving the dome has been entirely obviated. In order not to consume much gas the engine was usually kept running at a low rate of speed, and thus gave a slow motion to the dome, in such a way that it could be brought to the right position while the telescope was being set. The average consumption of gas per month has been about 1,250 feet, at a cost of \$1.56.

The shutters of the dome were first made of wood, but they soon became warped, unmanageable, and could not be closed. After some exposure of the instrument a sail-cloth shutter was placed over the opening as a makeshift. Such a shutter was found to work well, and it has been retained until the present time. At first the cloth shutter was raised and lowered by means of wire ropes running over pulleys on the top of the dome, but this arrangement gave trouble by the wind blowing the ropes off the pulleys and making it necessary for some one to climb the dome to adjust the

ropes. A better method was devised in 1885 by Mr. G. ANDERSON. The wire ropes were done away with, and the shutters were raised and lowered by common ropes running through blocks. This method has worked well. The cloth shutter has to be renewed once in eighteen months.

The objective has remained in good condition, and its defining power appears to be equal to what it was at first. In good seeing the performance is excellent. This objective has one defect which it may be worth while to remedy if an opportunity should offer. As the two lenses are placed very near each other and the inner surfaces have the same curvature, a halo of light is shown around bright objects. This might be removed by changing the curvature of the inner surfaces.

§ 3.

We may determine the position of the instrument by polar coördinates. Thus, if we denote by λ the distance of the pole of the instrument from the pole of the heavens, by h its hour angle, and by τ and δ the hour angle and declination of the object observed, the correction to an observed angle of position will be

$$\lambda \sin (\tau - h) \sec \delta$$

The following table contains the values of λ and h , which have been found from observation since the position of the instrument was readjusted in 1874. The adjusting screws have not been moved since that time. Each determination depends on the observation of a pole star, generally Polaris or δ Ursæ Minoris, and two equatorial stars:

Date.	λ	h
1876, December 13,	1'.62	169°.88
1877, January 9,	1.63	170.30
1878, January 3,	1.42	160.67
1879, May 22,	1.66	147.27
1880, January 29.	1.65	139.95
1880, January 31,	1.70	141.82
1881, May 10,	1.63	171.88
1882, June 1,	1.86	213.90
1882, August 30,	1.83	148.58
1883, May 18,	1.96	175.00
1883, December 29,	1.46	205.17
1884, December 3,	1.55	180.27
1885, August 26,	1.88	151.58
1886, December 10,	1.69	154.17
1889, May 15,	1.84	174.35
1890, May 8,	1.84	176.90
1891, September 30,	1.61	175.18

It will be seen that during this time the distance of the pole of the instrument from the pole of the heavens has been nearly constant, or the differences from a mean value lie fairly within the errors of observation. But the values of h show greater

changes, and the coördinate of the instrumental pole perpendicular to the plane of the meridian has been variable. This arises probably from the form of the mounting of the telescope. However, the corrections of the angles of position are not sensible in the observations.

In order to test again the flexure of the tube the following stars were observed near the meridian, the instrument being reversed on each star, and after corrections were applied for refraction and index error, the instrumental declinations were as follows:

1891, October 3: Ther., $72^{\circ}.8$.

					°	'
51	Cephei <i>subpolo</i>	-	-	-	+	87 14.62
ϵ	Draconis	-	-	-	+	69 57.75
γ	Cygni	-	-	-	+	39 52.76
1	Pegasi	-	-	-	+	19 18.64
ζ	Cygni	-	-	-	+	29 45.24
β	Aquarii	-	-	-	-	6 4.78
ϵ	Pegasi	-	-	-	+	9 20.93
μ	Capricorni	-	-	-	-	14 5.73
ζ	Capricorni	-	-	-	-	22 54.71

Assuming the equation for flexure to be of the form

$$\xi + \sin z \cdot \epsilon + n = 0$$

ϵ being the flexure and z the zenith distance, we have by comparing with the known declinations the following equations of condition:

Equations.	Residuals.
$\xi - 0.808 \epsilon + 1.86 = 0$	- 0.06
$\xi - 0.517 \epsilon + 1.98 = 0$	+ 0.06
$\xi - 0.018 \epsilon + 2.01 = 0$	+ 0.10
$\xi + 0.335 \epsilon + 1.92 = 0$	+ 0.02
$\xi + 0.158 \epsilon + 1.85 = 0$	- 0.06
$\xi + 0.706 \epsilon + 1.92 = 0$	+ 0.02
$\xi + 0.493 \epsilon + 1.84 = 0$	- 0.06
$\xi + 0.798 \epsilon + 2.00 = 0$	+ 0.08
$\xi + 0.881 \epsilon + 1.80 = 0$	- 0.10

The normal equations are

$$\begin{aligned} 9 \xi + 2.028 \epsilon + 17.18 &= 0 \\ + 3.211 \epsilon + 3.82 &= 0 \end{aligned}$$

The solution gives

$$\xi = -1'.91; \quad \text{and} \quad \varepsilon = +0'.018,$$

so that the flexure is not sensible.

§ 4.

The micrometer used in these observations is the one originally made for this instrument. It has been in use eighteen years, and the screw appears to be still in good condition. The following tables give the results for the periodical errors of this screw. The measurements were made with the HARKNESS engine, and those of 1886 were made by Lieut. WILLIAM H. ALLEN, U. S. Navy:

1886, September 10.

	Δ		Δ		Δ		Δ		Δ
r. 59.0	0.100	r. 60.0	0.099	r. 61.0	0.090	r. 62.0	0.093	r. 63.0	0.093
.1	0.093	.1	0.095	.1	0.097	.1	0.097	.1	0.100
.2	0.097	.2	0.093	.2	0.093	.2	0.100	.2	0.100
.3	0.090	.3	0.093	.3	0.100	.3	0.097	.3	0.093
.4	0.090	.4	0.097	.4	0.097	.4	0.093	.4	0.097
.5	0.103	.5	0.097	.5	0.093	.5	0.097	.5	0.090
.6	0.094	.6	0.093	.6	0.093	.6	0.093	.6	0.095
.7	0.093	.7	0.090	.7	0.095	.7	0.092	.7	0.088
.8	0.093	.8	0.097	.8	0.092	.8	0.088	.8	0.090
59.9	0.090	60.9	0.093	61.9	0.090	62.9	0.097	63.9	0.097

	Δ		Δ		Δ		Δ		Δ
r. 64.0	0.097	r. 65.0	0.097	r. 66.0	0.093	r. 67.0	0.093	r. 68.0	0.092
.1	0.103	.1	0.093	.1	0.090	.1	0.097	.1	0.090
.2	0.097	.2	0.090	.2	0.097	.2	0.087	.2	0.097
.3	0.097	.3	0.099	.3	0.090	.3	0.093	.3	0.093
.4	0.098	.4	0.095	.4	0.096	.4	0.100	.4	0.093
.5	0.088	.5	0.090	.5	0.097	.5	0.097	.5	0.100
.6	0.094	.6	0.093	.6	0.097	.6	0.096	.6	0.094
.7	0.093	.7	0.097	.7	0.093	.7	0.097	.7	0.093
.9	0.100	.8	0.096	.8	0.100	.8	0.088	.8	0.095
64.9	0.093	65.9	0.094	66.9	0.090	67.9	0.100	68.9	0.097

The means for each tenth of a revolution give,

Micrometer.		Δ	Residuals.	
r.	r.	d.		
0.0	to 0.1	0.0947	+	1
0.1	0.2	0.0955	+	9
0.2	0.3	0.0951	+	5
0.3	0.4	0.0945	—	1
0.4	0.5	0.0956	+	10
0.5	0.6	0.0952	+	6
0.6	0.7	0.0942	—	4
0.7	0.8	0.0931	—	15
0.8	0.9	0.0939	—	7
0.9	0.0	0.0941	—	5
Mean: $\Delta = 0.0946 = 0''.995$				

If u be the angular value of the reading of the head, these measurements give for the periodical correction

$$\varphi(u) = +0''.0087 \sin u - 0''.0005 \cos u - 0''.0002 \sin 2u + 0''.0052 \cos 2u$$

Mr. Allen's measurements were made by reading the glass scale of the engine, and the pointings could not be made so exactly as with the micrometer of the eyepiece, but they show that the periodical errors are small.

The following measurements were made with the micrometer:

1891, October 6.

	Δ		Δ		Δ		Δ		Δ
r.		r.		r.		r.		r.	
59.0	0.639	60.0	0.661	61.0	0.647	62.0	0.644	63.0	0.646
.1	0.645	.1	0.645	.1	0.649	.1	0.645	.1	0.645
.2	0.647	.2	0.650	.2	0.655	.2	0.644	.2	0.646
.3	0.656	.3	0.664	.3	0.666	.3	0.671	.3	0.655
.4	0.639	.4	0.640	.4	0.637	.4	0.646	.4	0.649
.5	0.654	.5	0.657	.5	0.648	.5	0.648	.5	0.649
.6	0.655	.6	0.657	.6	0.663	.6	0.641	.6	0.647
.7	0.637	.7	0.653	.7	0.651	.7	0.636	.7	0.643
.8	0.668	.8	0.644	.8	0.647	.8	0.656	.8	0.651
59.9	0.646	60.9	0.655	61.9	0.665	62.9	0.649	63.9	0.642

	Δ		Δ		Δ		Δ		Δ
r. 64.0	0.643	r. 65.0	0.668	r. 66.0	0.659	r. 67.0	0.644	r. 68.0	0.669
.1	0.658	.1	0.657	.1	0.618	.1	0.658	.1	0.631
.2	0.647	.2	0.634	.2	0.664	.2	0.632	.2	0.654
.3	0.659	.3	0.662	.3	0.635	.3	0.659	.3	0.675
.4	0.646	.4	0.630	.4	0.657	.4	0.662	.4	0.617
.5	0.644	.5	0.654	.5	0.637	.5	0.629	.5	0.646
.6	0.645	.6	0.640	.6	0.647	.6	0.660	.6	0.637
.7	0.645	.7	0.650	.7	0.650	.7	0.635	.7	0.652
.8	0.654	.8	0.638	.8	0.642	.8	0.648	.8	0.637
64.9	0.641	65.9	0.655	66.9	0.652	67.9	0.640	68.9	0.667

Micrometer.		Δ	Residuals.	
r.	r.	d.		
0.0 to 0.1	0.1	0.6520	+	32
0.1	0.2	0.6451	—	37
0.2	0.3	0.6473	—	15
0.3	0.4	0.6602	+	114
0.4	0.5	0.6423	—	65
0.5	0.6	0.6466	—	22
0.6	0.7	0.6492	+	4
0.7	0.8	0.6452	—	36
0.8	0.9	0.6485	—	3
0.9	0.0	0.4512	+	24
Mean = 0.6488 = 0''.995				

The residuals give the formula for periodical errors:

$$\varphi(u) = +0''.0016 \sin u + 0''.0019 \cos u - 0''.0027 \sin 2u - 0''.0016 \cos 2u$$

Although these coefficients are a little larger than those found in 1880 they are within the limits of the errors of measurement. The micrometer is so constructed that the use of the screw has been chiefly near the revolution 64^r.0.

The following values of one revolution of the screw of the micrometer were determined by Professors HOLDEN and FRISBY:

$$R = 9.9479 \quad \text{HOLDEN.}$$

$$R = 9.9465 \quad \text{FRISBY.}$$

Professor HOLDEN's value is given in the annual volume for 1877, Appendix I, p. 41. His result depends chiefly on 964 transits of quick-moving stars, and on three measures of the difference of declination of 42 and 44 Orionis. Professor FRISBY's value was found from transits of stars between the declinations of $+86^\circ$ and $+88^\circ$, which were observed on 47 nights from 1881 to 1883. (See the volume for 1880, p. LXXIX.)

His result is:

$$R = 9''.9465 \pm 0''.00105 - [0''.0000639 \pm 0''.0000489] (\tau - 50^\circ)$$

τ being the reading of the Fahrenheit thermometer.

The value determined by Professor HOLDEN had been adopted and used in the reductions, and for the sake of uniformity it has been retained in reducing all the observations. My own measures of the differences of declination of known stars indicate that a slightly smaller value of a revolution of the screw would better satisfy my observations; but this result is not yet definitive, and this difference would hardly affect the following observations of double stars.

When this instrument was first mounted it was provided with both a field illumination and a method of illuminating the wires. The illumination of the field soon became too faint for use, on account of the tarnishing of the reflector placed inside the tube. An attempt was made in 1876 to renew the field illumination, but the light became faint again, and this method was given up. The illumination used in the observations has been from a hand lamp, which throws a red light on the wires through an opening in the end of the micrometer box.

The method of observing a double star was generally to separate the wires a convenient distance, and then to turn the position circle until the line joining the stars was parallel to the wires. Four settings of this kind were made, care being taken to give the circle a large angular motion between the readings. The mean of the readings of the position circle was taken, and the circle turned 90° and clamped. Two double distances were then measured, the wires being reversed between the readings. This method was followed for all stars having a distance less than $25''$. In the case of great distances, like those of the faint stars in the Pleiades, the stars were bisected with the wire for the angle, and single distances were measured, the coincidence of the wires being observed. In such cases the position of the wires was reversed on different nights.

The following table, giving the probable errors of a single observation, has been computed by Mr. F. B. LITTELL. The orders of the stars are those adopted by W. STRUVE, except that in Order VIII all the stars having a distance greater than $24''$ have been included. Most of the stars of this order are faint and difficult to observe.

Probable errors of a single observation.

Order.	Mean distance.	$r_1 p$	$r_1 s$	Number of observations.
	"	"	"	
I	0.62	± 0.013	± 0.029	750
II	1.44	0.021	0.048	759
III	2.94	0.029	0.048	686
IV	5.67	0.054	0.049	535
V	9.92	0.059	0.059	169
VI	13.88	0.072	0.044	69
VII	19.96	0.057	0.053	139
VIII	88.74	0.151	0.109	350

§ 5.

The driving clock has not been changed since it was remounted by Mr. GARDNER in 1876, and its performance has generally been good. The methods of controlling this clock by shifting the weights on the Huygen's loop, and adjusting the electromagnetic friction pad, have enabled us to make the clock drive well enough for the usual micrometrical work. But it is doubtful whether a complicated clock like this, with its turbine wheel, Huygen's loop and weights, conical pendulum and friction pad, with a long, slender rod to convey the power, is so good as a simpler clock driven by a weight. However, in our case, the clock has an abundance of power, and after the first year or two it was brought into subjection and made to work fairly well. It should be mentioned, also, that the interference of the wind and other disturbing causes, which act on such a long tube, render it difficult for any driving clock to always give a good performance. On evenings when the wind blows on the telescope, it is difficult to make satisfactory measurements, though the shutters be arranged to give as much protection as possible.

The differential refraction has been computed for all stars having a distance greater than $15''$, and this correction has been applied to the observed quantities. In the case of distances which exceed $10''$, and where the components admit of accurate measurement, this correction has also been applied, though it is generally smaller than the probable error of observation. This correction is denoted by $\Delta\rho$.

The observations are printed in the same form as those published in 1881.

The name of the star is given first, and then the right ascension and declination for 1880.0, together with the magnitudes. The columns give the date of the observation in decimals of a year, the sidereal time of the observation to the first decimal of an hour, the angle of position and the distance, and the weight of the observation estimated on a scale of 5. These estimates are based on the condition of the images only, 1 being an extremely poor condition and 5 a perfect condition. The last column gives the magnifying power, and under the head of Remarks are given occasional notes and inferences from previous observations.

In the observations of close pairs a few cases occur where there may be an error of 10° in the observed angle of position. Such an error is possible, and where the record is plain no change has been made.

At the end of these observations will be found an index of the stars observed. The numbers of the stars are those of the STRUVES for the most part. The faint stars observed in the Pleiades are referred to stars in BESSEL's list of 53 stars in this group. The Bessel stars have been numbered in the order in which they are printed in the *Astronomische Untersuchungen, Erster Band*, p. 237.

It was my intention to compute orbits of several of these stars, especially of ξ Ursæ Majoris, 70 Ophiuchi, and 61 Cygni, but I have not found time to do this.

In concluding my work on this instrument, I wish to express my sincere thanks to Mr. GEORGE ANDERSON, who has been a faithful assistant during the sixteen years.

OCTOBER 8, 1891.

Σ 3062. $\alpha = 0^h 0^m.1$ $\delta = 57^\circ 46'$ (7 and 8.)

Date.	Sid. Time.	p .	s .	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1881. 807	23. 0	304. 8	1. 35	2	383	
1. 810	22. 8	305. 0	1. 43	3	383	
1. 823	23. 1	306. 1	1. 37	2	383	
1. 878	23. 3	306. 3	1. 47	3	383	
1883. 933	0. 5	313. 0	1. 43	3	383	
3. 941	0. 6	311. 4	1. 44	2	383	
3. 949	0. 6	313. 9	1. 45	2	383	
1885. 774	21. 7	315. 8	1. 45	3	383	
5. 791	22. 3	313. 4	1. 41	2	606	
5. 796	20. 9	316. 2	1. 44	3	383	
5. 810	20. 2	317. 2	1. 59	3	383	
5. 818	20. 3	317. 9	1. 39	3	383	
1886. 908	23. 9	314. 8	1. 47	2	606	
6. 911	23. 2	314. 0	1. 52	2	606	
6. 914	22. 5	314. 9	1. 49	2	606	
6. 936	23. 1	315. 7	1. 41	2	383	
6. 938	23. 2	313. 6	1. 39	3	606	
1888. 893	22. 8	320. 9	1. 49	2	606	
8. 937	23. 2	319. 3	1. 13	2	606	Clouds, $\frac{1}{2}$ wt.
8. 959	23. 2	320. 1	1. 24	3	606	
8. 973	23. 6	317. 4	1. 48	2	383	
1889. 799	20. 3	322. 8	1. 42	2	606	
9. 802	20. 9	323. 6	1. 40	2	606	
9. 917	22. 3	324. 2	1. 46	2	383	
9. 923	23. 6	321. 6	1. 52	2	383	
1890. 772	20. 9	325. 1	1. 40	2	383	
. 774	20. 2	325. 1	1. 44	2	383	
. 777	20. 3	335. 1	1. 29	2	383	Cloudy.
. 799	20. 2	326. 3	1. 32	2	383	
. 818	20. 7	324. 2	1. 25	2	383	
1881. 829		305. 55	1. 405			
1883. 941		312. 77	1. 440			
1885. 798		316. 10	1. 456			
1886. 921		314. 60	1. 456			
1888. 940		319. 44	1. 364			
1889. 860		323. 05	1. 450			
1890. 788		325. 16	1. 340			This star has a periodic time of about one hundred years. Its greatest apparent distance is $1''.5$, and its smallest $0''.5$. Since the time of Σ , it has described 288° of angular motion.

Σ 3063.

$$a = 0^h 1^m.5 \quad \delta = -5^\circ 12' \quad (9 \text{ and } 10.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1884.928	h. 0.3	° 219.1	// 2.10	3	383	Orbital movement is doubtful.
4.960	0.2	218.4	2.06	2	383	
1886.960	23.6	222.4	1.67	2	383	
6.971	23.9	222.6	1.72	2	383	
1884.944		218.75	2.080			
1886.966		222.50	1.685			

 Σ 2.

$$a = 0^h 2^m.7 \quad \delta = 79^\circ 2' \quad (6 \text{ and } 7.)$$

1888.984	23.7	3.1	0.36	2	606	Not separated. Elongated.
8.986	23.7	4.1	0.30	2	888	
1888.985		3.60	0.330			

 $O\Sigma$ 2. A and B .

$$a = 0^h 7^m.4 \quad \delta = 26^\circ 20' \quad (7 \text{ and } 8.)$$

1889.983	0.0	34.9	0.74	3	606	Probably a slow retrograde movement.
9.994	23.7	42.5	0.58	3	606	
1890.041	1.9	38.1	0.61	3	606	
1890.006		38.50	0.643			

 $O\Sigma$ 2. $\frac{AB}{2}$ and C . (7 and 10.)

1889.983	0.2	224.4	18.15	3	606	Clock running fast.
9.994	23.9	224.7	17.91	3	606	
1890.041	2.1	224.4	17.82	3	606	
1890.006	$\Delta \rho$	224.50	17.960			
		0.00	+ 0.005			
		224.50	17.965			

35 Piscium.

$$a = 0^h 8^m.8 \quad \delta = 8^\circ 9' \quad (6 \text{ and } 8.)$$

1886.908	0.2	149.1	11.67	3	383	Very unsteady; $\frac{1}{2}$ wt.
6.914	22.8	149.1	11.53	2	383	
6.936	23.4	148.6	11.29	2	383	
1886.919		149.00	11.538			

Σ 13.

$$a = 0^h 9^m.1 \quad \delta = 76^\circ 19' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1885. 821	h. 20. 5	° 91. 1	// 0. 65	3	606	A slow retrograde motion.
5. 823	21. 7	94. 6	0. 65	2	383	
5. 834	20. 8	91. 8	0. 68	2	383	
1888. 984	23. 9	89. 5	0. 72	2	606	
8. 986	22. 9	89. 0	0. 86	2	606	
8. 995	0. 0	89. 1	0. 69	2	606	
1885. 826		92. 50	0. 660			
1888. 988		89. 20	0. 757			

 Σ 19.

$$a = 0^h 10^m.3 \quad \delta = 35^\circ 54' \quad (7 \text{ and } 10.)$$

1885. 834	21. 4	134. 3	2. 33	2	383	Images blurred.
5. 922	23. 3	134. 7	2. 28	2	383	
1887. 952	23. 6	137. 8	2. 25	2	606	
7. 960	23. 5	134. 7	2. 27	3	383	
1885. 893		134. 57	2. 297			
1887. 956		136. 25	2. 260			Apparently a small direct motion.

Anonyma.

$$a = 0^h 10^m.5 \quad \delta = 36^\circ 0' \quad (8 \text{ and } 10.)$$

1889. 917	22. 6	133. 9	2. 43	3	383	Windy.
9. 928	22. 7	133. 3	2. 46	3	383	
9. 934	23. 8	131. 3	2. 31	2	383	
1889. 926		132. 83	2. 400			Observed by mistake for O Σ 9.

38 Piscium.

$$a = 0^h 11^m.2 \quad \delta = 8^\circ 12' \quad (7 \text{ and } 8.)$$

1886. 908	0. 4	236. 8	4. 32	2	383	Unsteady.
6. 914	23. 0	236. 3	4. 54	2	383	
6. 936	23. 7	237. 7	4. 60	2	383	
1886. 919		236. 93	4. 487			No motion.

Σ 23.

$$\alpha = 0^h 11^m.3 \quad \delta = -0^\circ 23' \quad (7 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884. 928	0. 5	346. 7	7. 39	3	383	Clouds.
4. 960	0. 4	343. 8	7. 58	2	383	
1885. 796	21. 9	347. 3	7. 40	2	383	
5. 810	22. 3	347. 7	7. 50	2	383	
5. 821	21. 6	347. 8	7. 29	2	383	
1887. 932	22. 3	346. 1	7. 01	3	383	
7. 938	23. 6	346. 5	7. 07	2	383	
7. 949	0. 3	347. 0	6. 84	2	383	
1884. 944		345. 25	7. 485			
1885. 809		347. 60	7. 397			
1887. 940		346. 53	6. 973			Diminution of distance.

 Σ 24.

$$\alpha = 0^h 12^m.3 \quad \delta = 25^\circ 28' \quad (7 \text{ and } 8.)$$

1885. 791	22. 6	248. 4	5. 17	2	383	No motion.
5. 796	21. 2	248. 2	5. 18	3	383	
5. 810	22. 1	247. 2	5. 09	2	383	
1885. 799		247. 93	5. 147			

42 Piscium.

$$\alpha = 0^h 16^m.2 \quad \delta = 12^\circ 49' \quad (7 \text{ and } 11.)$$

1886. 908	0. 6	334. 5	29. 28	3	383	Clouds.
6. 914	23. 3	335. 2	29. 53	2	383	
6. 936	23. 9	334. 8	29. 60	2	383	
6. 938	0. 0	335. 1	29. 43	3	383	
1886. 924		334. 90	29. 460			
	$\Delta\rho$	0. 00	+ 0. 010			Diminution of distance.
		334. 90	+ 29. 470			

 λ Cassiopeæ

$$\alpha = 0^h 25^m.2 \quad \delta = 53^\circ 52'' \quad (5 \text{ and } 6.)$$

1885. 821	20. 8	147. 2	0. 65	2	383	Thin clouds.
5. 823	22. 2	144. 4	0. 53	2	383	
5. 889	23. 1	145. 9	0. 51	2	606	
1888. 959	23. 6	149. 2	0. 47	2	606	
8. 973	0. 0	144. 8	0. 54	2	606	
8. 978	0. 0	145. 1	0. 46	3	606	
1885. 844		145. 83	0. 563			
1888. 970		146. 37	0. 490			Probably a binary star.

51 Piscium.

$$\alpha = 0^{\text{h}} 26^{\text{m}}.2 \quad \delta = 6^{\circ} 18' \quad (5 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1886.938	h. 0.3	82.6	// 27.75	2	383	
6.941	23.2	82.1	27.56	3	383	
6.944	23.7	82.2	27.60	3	383	
1886.941	$\Delta\rho$	82.30	27.637			
		0.00	+ 0.009			
		82.30	27.646			No motion.

82 Ceti.

$$\alpha = 0^{\text{h}} 31^{\text{m}}.2 \quad \delta = -25^{\circ} 23' \quad (6 \text{ and } 6.)$$

1889.983	0.4	111.9	0.84	2	606	Blurred.
9.994	0.4	110.9	0.92	2	606	Blurred.
1889.988		111.40	0.880			

 Σ 44.

$$\alpha = 0^{\text{h}} 32^{\text{m}}.0 \quad \delta = 40^{\circ} 20' \quad (8 \text{ and } 9.)$$

1885.889	23.6	265.3	9.29	2	383	
5.908	23.9	265.4	9.48	2	383	Misty.
1885.898		265.35	9.385			Increase of distance.

55 Piscium.

$$\alpha = 0^{\text{h}} 33^{\text{m}}.6 \quad \delta = 20^{\circ} 47' \quad (5 \text{ and } 8.)$$

1886.941	23.5	191.8	6.57	3	383	
6.944	23.9	191.9	6.73	2	383	
6.947	23.3	193.8	6.50	3	383	
1886.944		192.50	6.600			No motion.

 $O\Sigma$ 18.

$$\alpha = 0^{\text{h}} 36^{\text{m}}.0 \quad \delta = 3^{\circ} 50' \quad (8 \text{ and } 10.)$$

1888.970	1.1	123.9	1.45	2	383	
8.973	0.3	124.4	1.29	2	606	
1886.972		124.15	1.370			

Nova Andromedæ 1885. $\alpha = 0^h 36^m.4$ $\delta = 40^\circ 38'$ (Compared with Lamont α .)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$'$			
1885. 747	21. 0	82. 30	109. 93	3	383	The Nova is a 9th mag.
5. 758	21. 0	82. 22	109. 91	3	383	About 9th mag.; clouds.
5. 766	20. 5	82. 28	109. 69	2	383	Less than 9th mag. A little brighter than Lamont α .
5. 774	20. 9	82. 15	109. 63	3	383	The Nova is 10th mag. A little brighter than Lamont α .
5. 791	21. 0	82. 32	109. 79	2	383	Still a little brighter than Lamont α .
5. 818	21. 0	82. 15	109. 55	2	383	Fainter, but still a little brighter than Lamont α ; say $10^m.7$.
5. 821	21. 2	82. 23	109. 52	2	383	Fainter, but a trifle brighter than Lamont α . Poor images.
5. 834	21. 2	82. 35	109. 75	2	383	
5. 846	22. 2	82. 23	109. 55	2	385	Still a little brighter than Lamont α .
5. 900	23. 0	82. 20	109. 34	2	383	Fainter than Lamont α .
5. 922	23. 0	82. 20	109. 24	3	383	Decidedly fainter than Lamont α .
5. 933	23. 2	82. 28	109. 28	2	383	$\frac{1}{2}$ mag. fainter than Lamont α .
5. 949	0. 2	82. 13	109. 24	3	383	Very faint, 15th mag.; misty. 13th or 14th mag.
6. 004	1. 3	82. 25	110. 15	2	383	
6. 007	1. 3	82. 30	109. 37	3	383	
6. 084	3. 2	82. 28	108. 63	2	383	Very faint; 16th mag. Nearly lost in the nebula.
6. 166	3. 8	82. 18	109. 45	3	383	Very faint; 16th mag.
1885. 886		82. 24	109. 531			Corrected for differential refraction.

 Σ 51. $\alpha = 0^h 37^m.3$ $\delta = 16^\circ 42'$ (8 and 9.)

1885. 922	23. 7	130. 3	4. 16	2	383	No motion.
5. 933	23. 5	127. 7	4. 21	2	383	
1885. 927		129. 0	4. 185			

78 Cassiopeæ. $\alpha = 0^h 41^m.2$ $\delta = 50^\circ 47'$ (7 and 8.)

1885. 796	22. 5	146. 6	2. 09	3	383	Perhaps a slow motion.
5. 810	20. 7	146. 9	2. 04	3	383	
5. 818	20. 7	148. 0	1. 93	3	383	
5. 889	23. 3	145. 6	2. 10	2	606	
1885. 828		146. 78	2. 040			

η Cassiopeæ = Σ 60.

$$\alpha = 0^{\text{h}} 41^{\text{m}}.7 \quad \delta = 57^{\circ} 11' \quad (4 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1881.810	23.1	158.8	5.33	2	383	
1.878	23.5	161.6	5.25	2	383	
1.960	0.4	166.1	5.25	3	383	
1.963	0.5	165.9	5.36	3	383	
1883.933	0.8	170.0	5.12	3	383	
3.941	0.8	168.2	5.12	2	383	
3.949	0.9	168.2	5.12	2	383	
1885.796	22.2	172.0	5.07	3	383	
5.805	20.4	174.1	5.03	3	383	
5.818	20.5	173.8	5.07	3	383	
5.821	21.0	173.9	5.05	2	383	
5.823	21.9	173.2	5.07	2	383	
1886.938	23.4	172.5	4.98	3	383	
6.941	22.7	174.9	5.12	3	383	
6.944	23.0	176.0	4.93	3	606	
6.947	23.0	177.6	4.98	3	606	
6.955	23.3	175.7	4.94	2	383	Clouds.
1888.959	23.4	181.0	4.92	3	606	
8.973	23.8	183.1	4.95	2	383	
8.978	23.8	184.8	4.86	3	383	
8.981	23.6	184.1	4.78	2	383	
1889.800	20.6	184.4	4.92	2	606	Hazy.
9.801	21.1	184.9	5.12	2	383	
9.917	22.9	185.5	4.99	2	383	
9.923	23.9	186.9	4.89	2	383	
1890.772	21.2	188.3	5.02	2	383	
.774	20.4	188.0	5.03	2	383	
.777	20.5	187.2	5.07	2	383	Cloudy.
.799	20.4	188.9	5.19	2	383	
.818	20.9	189.4	5.02	2	383	
1881.903		163.10	5.298			
1883.941		168.80	5.120			
1885.813		173.40	5.058			
1886.946		175.34	4.990			
1888.973		183.25	4.878			
1889.860		185.42	4.980			The period of this star is about 200 years.
1890.788		188.36	5.066			The components are of beautiful colors.
65 Piscium = Σ 61.						
$\alpha = 0^{\text{h}} 43^{\text{m}}.0 \quad \delta = +27^{\circ} 0' \quad (6 \text{ and } 6.)$						
1885.922	0.0	117.1	4.53		383	Blazing image.
5.936	23.3	118.5	4.50	3	383	
1885.929		117.80	4.515			No motion.

Σ 64.

$$a = 0^h 44^m.6 \quad \delta = +40^\circ 33' \quad (9 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1886. 938	h. 23.7	o 271.4	// 3.73	3	383	No motion.
6. 941	22.9	272.7	3.71	3	383	
6. 944	23.2	272.9	3.57	3	383	
1886. 941		272.33	3.670			

 $O\Sigma$ 20.

$$a = 0^h 46^m.6 \quad \delta = 18^\circ 22' \quad (6 \text{ and } 7.)$$

1887. 960	23.8	228.8	0.51	3	606	
7. 998	0.4	221.2	0.57	3	606	
1887. 979		225.00	0.540			

36 Andromedæ = Σ 73.

$$a = 0^h 48^m.3 \quad \delta = +22^\circ 57' \quad (6 \text{ and } 7.)$$

1886. 941	23.7	8.3	1.31	3	606	Clouds.
6. 944	23.4	6.9	1.23	3	606	
6. 947	23.5	8.9	1.20	3	606	
6. 955	23.7	7.6	1.20	2	383	
1889. 923	0.6	8.7	1.08	2	606	
9. 928	23.0	10.3	1.20	2	606	
9. 950	22.9	9.9	1.22	3	606	
1886. 947		7.92	1.235			A binary of long period.
1889. 934		9.63	1.167			

 Σ 80.

$$a = 0^h 53^m.3 \quad \delta = +0^\circ 9' \quad (7 \text{ and } 8.)$$

1885. 922	0.3	314.7	20.58	2	383	Cloudy.
5. 933	23.8	315.1	20.75	2	383	
5. 938	1.9	314.8	20.37	3	383	
1885. 931	$\Delta\rho =$	314.87 0.00	20.567 + 0.007			Increase of distance.
		314.87	20.574			

Σ 86.

$$\alpha = 0^h 58^m.7 \quad \delta = -6^\circ 7' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885. 922	h. 0. 6	° 158. 9	// 13. 32	2	383	Motion.
5. 933	0. 1	159. 3	13. 13	2	383	
5. 947	23. 5	159. 3	13. 16	2	383	
1885. 934	$\Delta p =$	159. 17	13. 203			
		0. 00	+ 0. 004			
		159. 17	13. 207			

201 Piscium.

$$\alpha = 1^h 3^m.1 \quad \delta = 23^\circ 9' \quad (7 \text{ and } 9.)$$

1887. 913	23. 9	108. 4	0. 60	3	383	Cloudy.
7. 916	0. 6	101. 6	0. 52	2	606	
7. 932	23. 5	101. 6	0. 69	2	383	
7. 938	23. 8	100. 6	0. 64	2	606	
1887. 925		103. 05	0. 612			Very little motion.

 φ **Piscium.**

$$\alpha = 1^h 7^m.2 \quad \delta = 23^\circ 57' \quad (5 \text{ and } 10.)$$

1886. 941	23. 9	226. 0	7. 97	3	383	No motio
6. 944	0. 1	225. 9	8. 12	3	383	
6. 947	23. 8	227. 0	8. 03	3	383	
1886. 944		226. 30	8. 040			

 Σ 102. $A B.$

$$\alpha = 1^h 10^m.1 \quad \delta = 48^\circ 25' \quad (7 \text{ and } 8.)$$

1886. 944	0. 3	302. 3	0. 52	3	606	No motion.
6. 947	0. 0	306. 9	0. 49	3	606	
6. 971	0. 2	305. 7	0. 50	2	606	
1886. 954		304. 97	0. 503			

 Σ 102. $\frac{AB}{2}$ and $C.$ (7 and 9.)

1886. 944	0. 4	224. 6	10. 14	3	606	
6. 947	0. 1	224. 5	10. 19	3	606	
6. 971	0. 3	224. 1	10. 15	2	606	
1886. 954		224. 40	10. 160			

Σ 113.

$$\alpha = 1^{\text{h}} 13^{\text{m}}.7 \quad \delta = -1^{\circ} 11' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1886.971	0.6	350.0	1.19	2	606	
6.974	0.1	349.8	1.39	2	606	
7.010	0.8	350.0	1.25	2	606	
1886.985		349.93	1.277			Very small motion.

Anonyma.

$$\alpha = 1^{\text{h}} 14^{\text{m}}.1 \quad \delta = -16^{\circ} 25' \quad (7 \text{ and } 7.)$$

1886.971	0.9	22.2	1.47	2	606	
6.974	0.5	21.1	1.47	2	383	
7.010	1.0	22.3	1.65	2	383	
1886.985		21.87	1.530			

 Σ 117. *A B.*

$$\alpha = 1^{\text{h}} 17^{\text{m}}.0 \quad \delta = 73^{\circ} 33' \quad (4 \text{ and } 10.)$$

1889.917	23.2	107.8	28.08	2	383	
9.923	0.2	107.9	28.05	2	383	
1889.920	$\Delta p =$	107.85	28.065			
		0.00	+ 0.009			
		107.85	28.074			Diminution of distance.

 Σ 117. *B C.* (10 and 10.)

1889.917	23.4	252.9	2.86	2	383	
9.923	0.3	254.8	2.83	2	383	
1889.920		253.85	2.845			No motion.

 Σ 118.

$$\alpha = 1^{\text{h}} 20^{\text{m}}.6 \quad \delta = 82^{\circ} 44' \quad (8 \text{ and } 10.)$$

1888.978	0.4	73.8	11.99	3	606	
8.981	23.9	74.1	12.00	2	383	
1888.980	$\Delta p =$	73.95	11.995			
		- 0.06	+ 0.004			
		73.89	11.999			Motion.

Σ 122.

$$a = 1^h 20^m.7 \quad \delta = 2^\circ 55' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power	Remarks.
386.971	h. 1.2	$^\circ$ 329.0	$''$ 6.06	2	606	
6.974	0.7	329.1	6.09	3	383	
7.010	1.2	327.1	6.06	2	383	
1886.985		328.40	6.070			Motion doubtful.

 Σ 133. *A* and *B*.

$$a = 1^h 25^m.9 \quad \delta = 35^\circ 13' \quad (7 \text{ and } 11.)$$

1887.013	0.7	185.3	3.01	3	383	
7.019	0.8	184.7	2.92	2	383	
7.032	0.9	183.1	2.97	3	383	
1887.021		184.37	2.967			Motion doubtful.

 Σ 133. *A* and *C*. (7 and 11.)

1887.013	0.9	196.5	26.12	3	383	
7.019	1.0	196.9	26.23	2	383	
7.032	1.0	196.9	26.11	3	383	
1887.021	$\Delta \rho =$	196.77	26.153			
		0.00	+ 0.007			
		196.77	+26.160			

 Σ 133. *A* and *D*. (7 and 12.)

1887.013	1.1	192.6	30.72	3	383	
7.019	1.2	192.5	30.68	2	383	
7.032	1.2	192.6	30.75	3	383	Clouds, faint.
1887.021	$\Delta \rho =$	192.57	30.717			
		0.00	+ 0.009			
		192.57	30.726			

 Σ 138. *A* and *B*.

$$a = 1^h 30^m.0 \quad \delta = 7^\circ 0' \quad (7 \text{ and } 7.)$$

1887.019	1.4	35.6	1.51	2	383	
7.032	1.5	34.0	1.34	3	383	
7.035	1.6	33.5	1.61	2	383	
1887.029		34.37	1.487			No motion since 1876.

τ Sculptoris.

$$\alpha = 1^{\text{h}} 30^{\text{m}}.6 \quad \delta = -30^{\circ} 31' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1888. 970	h. 1. 4	$^{\circ}$ 91. 5	// 2. 30	2	383	Blurred.
8. 973	1. 3	94. 9	2. 02	2	383	Blurred.
1888. 971		93. 20	2. 160			

 Σ 155.

$$\alpha = 1^{\text{h}} 37^{\text{m}}.9 \quad \delta = 8^{\circ} 54' \quad (7 \text{ and } 8.)$$

1887. 019	1. 7	327. 7	4. 80	2	383	No motion since 1876.
7. 032	1. 8	328. 9	4. 82	3	383	
7. 035	1. 8	328. 9	4. 72	2	383	
1887. 029		328. 50	4. 780			

 Σ 158.

$$\alpha = 1^{\text{h}} 39^{\text{m}}.8 \quad \delta = 32^{\circ} 35' \quad (8 \text{ and } 9.)$$

1887. 913	0. 2	256. 7	1. 95	3	383	Perhaps a slow motion.
7. 916	0. 8	255. 5	1. 86	2	606	
7. 930	0. 8	253. 8	1. 96	2	383	
1887. 920		253. 33	1. 923			

 ϵ Sculptoris.

$$\alpha = 1^{\text{h}} 40^{\text{m}}.0 \quad \delta = -25^{\circ} 39' \quad (6 \text{ and } 10.)$$

1887. 019	1. 9	57. 0	4. 80	2	383	Blurred.
7. 062	2. 2	62. 5	4. 52	2	383	Blurred; windy. Double weight.
7. 071	2. 2	61. 6	4. 39	2	383	
7. 076	2. 4	61. 2	4. 55	3	383	
1887. 057		61. 05	4. 554			

 Σ 175.

$$\alpha = 1^{\text{h}} 44^{\text{m}}.4 \quad \delta = 20^{\circ} 31' \quad (8 \text{ and } 9.)$$

1887. 930	1. 2	344. 9	15. 91	2	383	Increase of distance.
7. 932	0. 5	344. 9	15. 51	3	383	
7. 938	0. 1	344. 5	15. 53	3	383	
1887. 933	$\Delta\rho =$	344. 77 0. 00	15. 550 + 0. 004			
		344. 77	15. 554			

γ Arietis.

$$\alpha = 1^{\text{h}} 46^{\text{m}}.6 \quad \delta = 18^{\circ} 42' \quad (4 \text{ and } 4.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1886.955	h. 0.0	° 178.7	" 8.56	2	383	No motion.
6.974	0.9	180.2	8.57	2	383	
7.011	1.3	180.2	8.49	2	383	
1886.980		179.70	8.540			

 Σ 183. A and B .

$$\alpha = 1^{\text{h}} 48^{\text{m}}.3 \quad \delta = 28^{\circ} 14' \quad (7 \text{ and } 9.)$$

1887.938	0.3	175.0	0.51	2	606	A small retrograde motion.
7.952	0.1	2.6	0.51	3	606	
7.960	0.1	7.3	0.49	3	606	
7.998	0.6	4.9	0.53	2	606	
1887.962		2.45	0.510			

 Σ 183. $\frac{AB}{2}$ and C . (7 and 9.)

1887.938	0.4	160.6	5.64	2	606	
7.952	0.2	164.4	5.80	3	606	
7.960	0.2	163.3	5.74	2	606	
7.998	0.8	163.5	5.78	2	606	
1887.962		162.95	5.740			

 Σ 186.

$$\alpha = 1^{\text{h}} 49^{\text{m}}.7 \quad \delta = 1^{\circ} 15' \quad (7 \text{ and } 7.)$$

1887.913	0.6	207.7	0.47	2	606	Blurred.
8.039	1.4	211.2	0.41	3	606	
8.053	2.2	213.6	0.45	2	606	
1888.984	0.4	219.0	0.53	2	606	
8.986	0.8	212.8	0.46	3	606	
8.995	0.7	204.5	0.45	2	606	Blurred.
9.025	0.8	208.8	0.43	3	606	
1889.983	1.0	219.0	0.44	3	606	
9.994	0.6	42.9	0.33	2	888	
1888.002		210.83	0.443			
1888.998		211.12	0.460			Motion.
1889.988		220.95	0.385			

Σ 191.

$$\alpha = 1^h 52^m.1 \quad \delta = 73^\circ 15' \quad (6 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	//			
1881. 810	23. 4	193. 8	5. 72	2	383	
1. 878	23. 8	194. 1	5. 64	3	383	
1. 960	0. 7	193. 6	5. 50	3	383	
1. 963	0. 8	193. 5	3. 37	3	383	
1881. 903		193. 75	5. 558			No motion.

 β Cassiopeæ.

$$\alpha = 1^h 52^m.1 \quad \delta = 70^\circ 19' \quad (5 \text{ and } 8.)$$

1888. 984	0. 2	305. 4	0. 84	2	606	
8. 986	0. 1	304. 9	0. 81	2	606	
8. 995	0. 2	304. 3	0. 75	2	606	
1888. 988		304. 87	0. 800			

 α Piscium.

$$\alpha = 1^h 55^m.8 \quad \delta = 2^\circ 11' \quad (4 \text{ and } 5.)$$

1887. 032	2. 0	320. 1	2. 94	3	383	
7. 062	2. 6	318. 1	3. 02	3	383	
7. 076	2. 8	317. 6	2. 87	3	383	
7. 913	0. 9	321. 8	2. 96	2	383	
7. 916	1. 1	321. 2	3. 03	2	383	
7. 932	0. 7	321. 7	2. 99	2	383	
1887. 488		320. 08	2. 968			Motion.

 Σ 208.

$$\alpha = 1^h 56^m.8 \quad \delta = 25^\circ 22' \quad (7 \text{ and } 8.)$$

1888. 970	1. 6	52. 8	1. 22	2	383	
8. 973	0. 5	54. 3	1. 09	2	606	
8. 981	0. 2	54. 6	1. 07	3	383	
1888. 975		53. 90	1. 127			A slow orbital motion.

Anonyma.

$$\alpha = 2^{\text{h}} 4^{\text{m}}.9 \quad \delta = 56^{\circ} 41'$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888.986	h. 0.3	° 331.95	'' 59.17	3	606	Another star observed January 2, 1889, $p = 204^{\circ}.28$, $s = 102''.97$.
9.011	0.6	331.78	59.31	3	383	
1888.998	$\Delta p =$	331.86	59.240			
		+ 0.01	+ 0.017			
		331.87	59.257			

 ι Trianguli = Σ 227.

$$\alpha = 2^{\text{h}} 5^{\text{m}}.4 \quad \delta = 29^{\circ} 44' \quad (5 \text{ and } 6.)$$

1885.029	2.0	77.2	3.84	2	383	No motion.
5.038	2.0	77.2	3.81	2	383	
5.062	2.8	76.8	3.62	2	383	
1885.043		77.07	3.757			

 Σ 228.

$$\alpha = 2^{\text{h}} 6^{\text{m}}.3 \quad \delta = 46^{\circ} 55' \quad (6 \text{ and } 7.)$$

1881.960	1.0	154.1	0.44	2	888	Probably this angle should be $338^{\circ}.4$. Apparently a rapid angular motion. Blurred.
1.963	1.0	158.4	0.38	3	888	
1888.986	0.6	30.7	0.51	3	606	
8.995	0.4	22.9	0.41	2	606	
9.011	0.8	204.9	0.37	3	606	
1889.950	23.2	36.9	0.49	3	606	
9.983	0.7	41.2	0.38	2	888	
9.994	0.2	46.6	0.42	2	888	
1890.911	23.4	229.4	0.32	3	888	
0.952	0.5	50.3	0.32	3	888	
0.956	23.6	54.2	0.35	2	888	
1881.962		156.25	0.410			
1888.997		26.82	0.434			
1889.976		41.56	0.430			
1890.940		51.30	0.330			Motion.

 Σ 232.

$$\alpha = 2^{\text{h}} 7^{\text{m}}.7 \quad \delta = 29^{\circ} 50' \quad (7 \text{ and } 7.)$$

1885.062	2.7	66.2	6.77	3	383	No motion.
5.073	2.7	67.2	6.80	2	383	
1885.068		66.70	6.785			

Lalande 4219.

$$\alpha = 2^{\text{h}} 10^{\text{m}}.1 \quad \delta = -18^{\circ} 47' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1885.029	2.2	333.3	2.24	2	383	
5.038	2.2	333.5	2.40	2	383	
5.062	3.1	333.4	2.23	2	383	Some motion in angle.
1887.032	2.3	340.3	2.24	2	383	Clouds.
7.062	2.4	339.3	2.06	2	383	Cloudy; blurred.
7.071	2.5	340.4	2.17	2	383	Blurred; windy.
7.076	2.6	337.8	2.19	3	338	Double weight.
1890.949	1.9	344.9	1.96	2	383	
.952	1.8	342.8	2.08	3	606	
.958	2.1	343.2	2.15	2	383	
1885.043		333.40	2.290			
1887.062		338.94	2.184			
1890.953		343.63	2.063			Motion.
ι Cassiopeæ. A and B. $\alpha = 2^{\text{h}} 19^{\text{m}}.2 \quad \delta = 76^{\circ} 52' \quad (4 \text{ and } 7.)$						
1889.934	22.6	256.4	2.23	3	383	
9.936	22.6	257.6	2.25	3	383	
9.942	23.0	255.9	2.20	3	383	
1889.937		256.63	2.227			A slow angular motion.
ι Cassiopeæ. A and C. (4 and 8.)						
1889.934	22.8	112.1	7.42	3	383	
9.936	22.8	112.8	7.37	3	383	
9.942	23.2	112.5	7.53	3	383	
1889.937		112.47	7.440			
Σ 285. $\alpha = 2^{\text{h}} 31^{\text{m}}.0 \quad \delta = 32^{\circ} 59' \quad (7 \text{ and } 8.)$						
1887.938	0.9	169.0	2.02	2	383	
7.949	1.1	173.0	1.72	2	383	
7.960	0.4	173.5	1.78	2	383	
1887.949		171.83	1.840			Perhaps a slow motion.

Σ 295.

$$\alpha = 2^{\text{h}} 35^{\text{m}}.1 \quad \delta = -1^{\circ} 12' \quad (6 \text{ and } 10.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1885.029	2.5	319.4	4.54	2	383	
5.038	2.5	319.9	4.47	2	383	
5.062	3.3	320.3	4.58	2	383	
1885.043		319.87	4.530			Motion.

 Σ 296.

$$\alpha = 2^{\text{h}} 35^{\text{m}}.9 \quad \delta = 48^{\circ} 53' \quad (4 \text{ and } 10.)$$

1889.052	1.8	299.3	17.20	2	383	
9.055	1.9	299.4	16.93	3	383	
1889.054	$\Delta \rho$	299.35	17.065			
		0.00	+ 0.005			
		299.35	17.070			Increase of distance.

107 Arietis.

$$\alpha = 2^{\text{h}} 36^{\text{m}}.7 \quad \delta = 25^{\circ} 5' \quad (7 \text{ and } 11.)$$

1887.938	1.1	23.5	3.05	2	383	
7.949	1.3	19.3	3.05	2	383	
7.968	0.3	21.7	2.98	2	383	
1887.951		21.50	3.027			

 γ Ceti = Σ 299.

$$\alpha = 2^{\text{h}} 37^{\text{m}}.0 \quad \delta = 2^{\circ} 45' \quad (3 \text{ and } 7.)$$

1885.076	2.7	289.3	3.12	2	383	
5.082	2.9	287.8	2.95	2	383	
5.103	3.4	288.2	2.92	2	383	
1885.087		288.43	2.997			Motion doubtful.

 Σ 305.

$$\alpha = 2^{\text{h}} 40^{\text{m}}.7 \quad \delta = 18^{\circ} 52' \quad (7 \text{ and } 8.)$$

1885.076	3.0	317.5	2.69	2	383	
5.082	3.2	318.9	2.90	2	383	
5.103	3.7	318.4	2.91	2	383	
1885.087		318.27	2.833			Some motion.

G. A. 7

$$\alpha = 2^{\text{h}} 42^{\text{m}}.0 \quad \delta = 30^{\circ} 0' \quad (7.5 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889.036	h. 1.8	$^{\circ}$ 72.3	$''$ 4.78	3	383	Another companion, $p = 170^{\circ}$, $s = 20''$; of 12th mag.
9.038	2.2	71.8	4.88	3	383	
1889.037		72.05	4.830			

 Σ 311. A and B.

$$\alpha = 2^{\text{h}} 42^{\text{m}}.3 \quad \delta = 17^{\circ} 0' \quad (5 \text{ and } 8.)$$

1888.031	1.8	123.5	3.34	3	383	
8.039	1.6	122.1	3.39	3	606	
8.053	2.5	123.3	3.28	2	383	
1889.025	1.1	120.5	3.31	3	606	
9.033	2.3	122.9	3.17	3	383	
1888.041		122.97	3.337			
1889.029		121.70	3.240			No motion.

 Σ 311. A and C.

1888.031	2.0	109.7	25.29	2	383	
8.039	1.7	109.7	25.06	3	606	
8.053	2.6	109.8	25.15	2	383	
1889.025	1.3	109.3	25.28	3	606	
9.033	2.4	109.7	25.15	3	383	
1888.041		109.73	25.167			
1889.039		109.50	25.215			
	$\Delta p =$	0.00	+ 0.007			
		109.73	25.174			
		109.50	25.222			

 Σ 314.

$$\alpha = 2^{\text{h}} 44^{\text{m}}.3 \quad \delta = 52^{\circ} 30' \quad (7 \text{ and } 8.)$$

1889.934	23.3	301.0	1.66	2	383	
9.936	23.2	301.6	1.51	3	383	
9.942	23.7	302.7	1.51	2	383	
1889.937		301.77	1.560			

Motion in angle.

Σ 312.

$$\alpha = 2^{\text{h}} 44^{\text{m}}.8 \quad \delta = 72^{\circ} 26' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1889.934	h. 23.1	o 19.4	// 3.14	2	383	
9.936	23.0	18.7	3.26	3	383	
9.942	23.5	20.3	3.26	3	383	
1889.937		19.47	3.220			

Perhaps motion.

Σ 326.

$$\alpha = 2^{\text{h}} 48^{\text{m}}.5 \quad \delta = 26^{\circ} 24' \quad (7 \text{ and } 10.)$$

1887.938	1.3	216.5	8.20	3	383	
7.968	0.5	216.3	8.07	2	383	
1887.953		216.40	8.135			

No motion.

Σ 333.

$$\alpha = 2^{\text{h}} 52^{\text{m}}.3 \quad \delta = 20^{\circ} 51' \quad (6 \text{ and } 7.)$$

1888.039	1.9	201.5	1.30	3	606	
8.053	2.8	202.2	1.18	2	383	
8.058	2.8	199.5	1.20	2	383	
1888.050		201.07	1.227			

No motion in twelve years.

Σ 355.

$$\alpha = 3^{\text{h}} 0^{\text{m}}.9 \quad \delta = 7^{\circ} 56' \quad (9 \text{ and } 10.)$$

1885.076	3.2	145.9	2.57	2	383	Images blurred. Faint.
5.082	3.4	147.3	2.74	2	383	
5.103	3.9	147.2	2.63	2	383	
1888.039	2.2	146.7	2.73	3	606	
8.058	3.1	145.6	2.76	2	383	
1885.087		146.90	2.642			
1888.048		146.15	2.745			

No motion.

Σ 360.

$$\alpha = 3^{\text{h}} 4^{\text{m}}.5 \quad \delta = 36^{\circ} 46' \quad (8 \text{ and } 8.)$$

1888.970	1.9	136.1	1.80	2	383	
8.973	0.8	138.0	1.85	2	606	
8.984	0.7	137.6	1.80	2	606	
1888.976		137.23	1.817			

Motion.

12 Eridani.

$a = 3^h 7^m.0 \quad \delta = -29^\circ 27'$ (4 and 8.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1889.036	h. 2.9	° 328.3	// 2.02	2	383	Blurred.
9.038	2.5	325.0	1.92	2	383	Blurred.
1889.037		326.65	1.970			Motion in angle and distance.

Σ 367.

$a = 3^h 7^m.9 \quad \delta = 0^\circ 18'$ (8 and 8.)

1888.088	3.6	234.8	0.61	3	606	
8.091	3.2	232.9	0.68	3	606	
8.121	3.7	233.6	0.62	3	606	
1888.100		233.77	0.637			Motion in angle.

Σ 380.

$a = 3^h 15^m.3 \quad \delta = 8^\circ 20'$ (9 and 10.)

1888.088	3.8	70.8	1.23	3	606	
8.091	3.5	71.1	1.20	3	606	
8.121	3.9	73.9	1.13	3	606	
1888.100		71.93	1.187			Motion.

Σ 381.

$a = 3^h 16^m.4 \quad \delta = 20^\circ 32'$ (7 and 9.)

1888.970	2.5	99.3	0.97	2	383	
8.973	1.0	94.9	1.06	2	606	
8.984	1.4	98.4	1.00	2	383	
1888.976		97.53	1.010			Perhaps motion.

Σ 389.

$a = 3^h 20^m.5 \quad \delta = 58^\circ 57'$ (7 and 8.)

1889.928	2.0	66.0	2.87	2	383	Clock failed.
9.934	23.6	65.1	2.75	2	383	
9.936	23.5	64.1	2.67	3	383	
1889.933		65.07	2.763			Motion doubtful.

Σ 407.

$$\alpha = 3^{\text{h}} 24^{\text{m}}.3 \quad \delta = -11^{\circ} 32' \quad (8 \text{ and } 11.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1888.088	h. 4.1	0 46.3	// 2.68	2	606	Motion.
8.091	3.8	46.2	2.82	2	383	
8.121	4.1	49.2	2.69	3	383	
1888.100		47.23	2.730			

 Σ 408.

$$\alpha = 3^{\text{h}} 24^{\text{m}}.7 \quad \delta = -4^{\circ} 42' \quad (8 \text{ and } 8.)$$

1888.124	4.0	339.1	1.27	2	383	Perhaps motion.
8.127	4.1	338.4	1.24	2	383	
8.132	4.2	339.5	1.20	3	383	
1888.128		339.00	1.237			

 Σ 400.

$$\alpha = 3^{\text{h}} 25^{\text{m}}.2 \quad \delta = 59^{\circ} 32' \quad (7 \text{ and } 8.)$$

1889.928	2.3	317.6	0.62	2	606	Blurred.
9.936	23.7	313.8	0.62	2	606	
9.942	23.9	314.8	0.63	2	606	
1889.934		315.95	0.622			Motion in angle.

 Σ 412. A and B .

$$\alpha = 3^{\text{h}} 27^{\text{m}}.0 \quad \delta = 24^{\circ} 3' \quad (8 \text{ and } 8.)$$

1889.055	2.4	210.8	0.24	3	888	Motion in angle and distance.
9.063	2.1	213.5	0.25	3	888	
1889.059		212.15	0.245			

 Σ 412. $\frac{A+B}{2}$ and C . (8 and 10.)

1889.055	2.2	59.5	22.20	3	383		
9.063	2.3	60.2	22.06	3	606		
1889.059	$\Delta p =$	59.85	22.130				
		0.00	+ 0.006				
		59.85	22.136				

Σ 422.

$$a = 3^{\text{h}} 30^{\text{m}}.6 \quad \delta = 0^{\circ} 12' \quad (6 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889.063	h. 2.7	° 243.7	// 6.40	3	606	No motion.
9.066	2.3	244.8	6.33	2	383	
1889.064		244.25	6.365			

Weisse 564.

$$a = 3^{\text{h}} 32^{\text{m}}.0 \quad \delta = -8^{\circ} 5' \quad (9 \text{ and } 10.)$$

1887.998	3.2	278.3	5.75	2	383	Hazy; not this star.
8.039	2.4	331.1	1.89	3	606	Faint.
8.058	3.5	332.6	1.72	2	383	
1888.048		331.85	1.805			

 Σ 425.

$$a = 3^{\text{h}} 33^{\text{m}}.0 \quad \delta = 33^{\circ} 45' \quad (7 \text{ and } 7.)$$

1889.923	0.9	171.6	1.61	2	383	Not Σ 425.
9.928	1.5	93.9	2.67	2	383	
9.936	23.9	94.3	2.66	3	383	
1889.932		94.10	2.665			Motion in angle.

Anonyma.

$$a = 3^{\text{h}} 40^{\text{m}}.0 \quad \delta = 33^{\circ} 40' \quad (8 \text{ and } 10.)$$

1889.936	0.1	17.2	3.27	3	383	Hazy sky.
9.942	0.8	18.2	3.23	2	383	
1889.939		17.70	3.250			

 $O\Sigma$ 65.

$$a = 3^{\text{h}} 43^{\text{m}}.1 \quad \delta = 25^{\circ} 13' \quad (6 \text{ and } 7.)$$

1889.063	2.5	198.2	0.29	3	888	Blurred.
9.066	2.0	199.2	0.30	2	888	
1889.064		198.53	0.293			Diminution of distance.

ζ Persei.

$$a = 3^h 46^m.6 \quad \delta = 31^\circ 32' \quad (3 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889.066	h. 2.5	° 207.4	'' 12.89	3	383	
9.107	3.2	206.9	12.99	2	383	
9.121	3.7	207.9	12.84	3	383	
1889.098	$\Delta\rho =$	207.40	12.907			
		0.00	+ 0.004			
		207.40	12.911			Perhaps an increase of distance.

 ε Persei.

$$a = 3^h 49^m.8 \quad \delta = 39^\circ 40' \quad (3 \text{ and } 8.)$$

1889.066	2.7	10.0	8.85	3	383	
9.107	3.4	8.3	8.97	2	383	
9.121	3.9	8.9	8.98	3	383	
1889.098		9.07	8.933			No motion.

 Σ 460.

$$a = 3^h 50^m.0 \quad \delta = 80^\circ 22' \quad (5 \text{ and } 6.)$$

1890.911	23.8	41.3	0.91	3	606	Clouds.
0.925	0.7	41.1	0.88	2	606	
1890.918		41.20	0.895			Motion in angle.

 $O\Sigma$ 531.

$$a = 3^h 59^m.4 \quad \delta = 37^\circ 46' \quad (7 \text{ and } 8.)$$

1889.066	2.9	131.1	2.47	2	383	
9.107	3.6	132.4	2.27	2	383	
9.121	4.1	135.2	2.21	3	383	
1889.098		132.90	2.317			Motion.

OBSERVATIONS OF **63** FAINT STARS IN THE PLEIADES.

[Corrected for differential refraction.]

Alcyone. (1.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885. 947	h. 0. 2	° 226. 29	// 78. 86	2	383	Blazing images; 15th mag.
5. 950	0. 8	226. 19	79. 36	3	383	
1885. 948		226. 24	79. 11			

Alcyone. (2.)

1885. 947	0. 5	229. 07	144. 32	2	383	Blazing images; 13th mag.
5. 950	1. 0	229. 09	144. 89	3	383	
1885. 948		229. 08	144. 61			

Alcyone. (3.)

1885. 961	1. 4	54. 05	199. 09	2	383	11th mag.
5. 967	1. 2	53. 97	199. 62	2	383	Misty; faint.
5. 983	0. 6	53. 99	199. 78	3	383	
5. 986	0. 8	33. 99	199. 77	2	383	
1885. 974		54. 00	199. 57			

Alcyone. (4.)

1885. 961	1. 6	44. 77	219. 27	2	383	11th mag.
5. 967	1. 0	44. 84	220. 16	2	383	
5. 983	0. 4	44. 77	219. 64	2	383	
5. 986	0. 6	44. 71	220. 21	2	383	
1884. 974		44. 77	219. 82			

Bessel 39. (5.)

1885. 950	1. 3	216. 28	71. 65	3	383	15th mag.
5. 961	0. 8	216. 95	71. 63	3	383	Extremely faint.
1885. 956		216. 61	71. 64			

Bessel 35. (6.)

1885. 950	1. 4	209. 58	48. 53	3	383	13th mag.
5. 961	1. 0	209. 79	48. 41	2	383	
1885. 956		209. 68	48. 47			

Atlas. (7.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885.986	h. 1.3	° 282.44	" 92.71	2	383	13th mag.
5.991	0.8	282.77	93.06	2	383	
1885.988		282.60	92.88			

Atlas. (8.)

1885.986	1.5	42.48	46.88	2	383	15th mag.
5.991	1.0	42.22	46.82	2	383	
1885.988		42.35	46.85			

Atlas. (9.)

1885.986	1.7	63.38	112.07	2	383	14th mag. A triple star.
5.991	1.3	63.91	112.41	2	383	
1885.988		63.64	112.24			

Atlas. (10.)

1885.997	1.0	238.64	216.43	3	383	10th mag.
6.005	2.0	238.52	216.47	3	383	
1886.001		238.58	216.45			

Atlas. (11.)

1885.997	1.2	189.85	160.70	3	383	11th mag.
6.005	2.2	189.55	160.84	3	383	
1886.001		189.70	160.77			

Atlas. (12.)

1885.997	1.4	125.40	176.92	3	383	11.5 mag.
6.005	2.5	125.52	177.80	3	383	
1886.001		125.46	177.36			

Atlas. (13.)

1885.997	1.7	215.85	73.26	2	383	16th mag.
1887.122	5.0	215.00	73.73	3	383	
1886.560		215.42	73.50			

Pleione. (14.)

Date.	Sid. Time.	ρ	δ	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$'$			
1886.008	1.7	223.42	170.59	3	383	12th mag.
6.084	3.8	223.42	172.52	2	383	
6.106	4.2	223.40	171.87	2	383	
1886.066		223.41	171.66			

Pleione. (15.)

1886.008	1.9	273.20	219.44	3	383	10th mag.
6.019	1.5	273.11	220.00	2	383	Clouds.
1886.014		273.17	219.63			

Pleione. (16.)

1886.008	2.2	67.45	143.60	3	383	14th mag.; hazy.
6.084	3.6	67.32	141.64	2	383	
6.106	4.0	67.28	143.04	2	383	
1886.066		67.35	142.76			

Pleione. (17.)

1886.084	4.0	79.62	96.78	2	383	15th mag.
6.106	4.4	79.22	96.98	2	383	
1886.095		79.42	96.88			

Electra. (18.)

1886.109	4.0	143.70	105.90	2	383	13th mag.
6.112	3.7	144.22	105.79	2	383	
1886.110		143.96	105.84			

Electra. (19.)

1886.109	4.2	122.05	150.32	2	383	13th mag.
6.112	4.0	122.15	150.44	2	383	
1886.110		122.10	150.38			

Electra. (20.)

Date.	Sid. Time.	δ	s	Wt.	Power.	Remarks.
1886. 109	h. 4.4	° 191.50	// 221.16	2	383	11th mag.
6. 112	3.6	191.42	221.30	2	383	
1886. 110		191.46	231.23			

Electra. (21.)

1886. 131	. .	345.05	181.10	2	383	10th mag.
6. 134	. .	345.04	181.20	3	383	
7. 084	. .	344.92	181.17	2	383	
1886. 450		345.00	181.16			

Celæno. (22.)

1886. 131	. .	259.48	86.95	2	383	11th mag.
6. 134	. .	259.60	86.70	3	383	
7. 084	. .	259.65	86.42	2	383	
1886. 450		259.58	86.69			

Celæno. (23.)

1886. 134	. .	194.86	218.15	3	383	10th mag.
6. 147	. .	194.85	217.97	3	383	
7. 084	. .	194.85	217.67	3	383	
1886. 455		194.85	217.93			

Taygeta. (24.)

1886. 147	4.9	329.62	67.19	3	383	10th mag.
6. 150	4.9	329.38	67.33	2	383	
1886. 148		329.50	67.26			

Taygeta. (25.)

1886. 147	5.2	59.05	50.97	3	383	14th mag.
6. 150	5.2	59.22	50.98	2	383	
1886. 148		59.14	50.98			

Maia. (26.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1886. 153	h. 5.3	° 75.60	// 113.65	2	383	13th mag.
6. 164	5.3	75.58	113.88	2	383	
1886. 158		75.59	112.76			

Asterope. (27.)

1886. 164	5.6	73.40	170.99	2	383	12th mag.
6. 166	5.6	73.55	171.14	2	383	
1886. 165		73.48	171.06			

Bessel 45. (28.)

1886. 971	2.4	85.28	117.72	2	383	12th mag.
6. 974	1.2	85.27	117.40	2	383	
6. 985	1.5	85.44	117.59	3	383	
7. 130	5.4	85.75	117.52	2	383	
1887. 015		85.43	117.56			

Bessel 45. (29.)

1886. 971	2.6	107.31	184.98	2	383	12th mag.
6. 974	1.4	107.37	184.51	2	383	
6. 985	1.8	107.37	185.04	3	383	
1886. 977		107.35	184.84			

Bessel 45. (30.)

1887. 130	5.7	209.62	163.65	2	383	14th mag.
7. 138	5.0	209.65	163.39	3	383	
1887. 134		209.64	163.52			

Bessel 44. (31.)

1886. 985	2.1	15.62	66.28	3	383	10th mag.
7. 010	1.6	15.72	66.06	2	383	
1886. 998		15.67	66.17			

Bessel 44. (32.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1886.985	h. 2.4	° 239.88	" 83.53	3	383	10th mag.
7.010	1.8	239.58	83.32	2	383	
1886.998		239.73	83.42			

Bessel 44. (33.)

1886.985	2.6	270.48	145.38	3	383	12th mag.
7.010	2.0	270.57	145.21	2	383	
1886.998		270.52	145.30			

Bessel 44. (34.)

1886.985	. .	225.95	149.30	3	383	14th mag.; hazy. Ther. in dome 13°.
7.010	. .	226.25	149.04	2	383	
1886.998		226.10	149.17			

Bessel 47. (35.)

1887.012	1.5	103.01	96.53	3	383	10th mag.; clouds.
7.067	3.1	103.22	96.16	2	383	
1887.040		103.12	96.34			

Bessel 47. (36.)

1887.012	2.2	198.15	118.87	2	383	12th mag.; clouds.
7.067	3.3	197.92	118.88	2	383	
1887.040		198.04	118.88			

Bessel 22. (37.)

1887.062	2.9	231.70	69.91	3	383	11th mag.
7.064	2.9	231.70	70.26	2	383	
1887.063		231.70	70.09			

Bessel 22. (38.)

1887.062	3.2	254.15	154.05	2	383	11th mag.; cloudy.
7.064	3.2	254.38	154.11	2	383	
1887.063		254.26	154.08			

Bessel 22. (39.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887.062	h. 3.4	° 245.28	// 136.23	3	383	12th mag.
7.064	3.4	245.12	136.59	2	383	
1887.063		245.20	136.41			

Bessel 38. (40.)

1887.062	3.8	295.40	173.41	3	383	12th mag.
7.067	2.7	295.35	173.07	2	383	
1887.064		295.38	173.24			

Bessel 28. (41.)

1887.067	3.7	278.25	25.80	2	383	14th mag.
7.070	2.8	278.72	26.02	2	383	
7.152	5.9	279.75	26.01	2	383	
1887.096		278.91	25.94			

Bessel 33. (42.)

1887.070	3.3	19.42	88.18	2	383	15th-16th mag.
7.073	2.8	20.08	89.20	2	383	
7.075	3.0	19.45	87.81	2	383	
1887.073		19.65	88.40			

Bessel 29. (43.)

1887.070	3.6	102.90	36.46	2	383	15th-16th mag.
7.073	3.3	102.45	36.34	3	383	
1887.072		102.68	36.40			

Bessel 29. (44.)

1887.070	3.8	64.95	129.82	2	383	12th mag.
7.073	3.1	64.88	130.24	3	383	
1887.072		64.92	130.03			

Bessel 30. (45.)

1887.070	4.0	326.28	7.01	2	383	11th mag.
7.073	3.5	329.18	6.94	3	383	
7.075	3.2	329.95	6.89	3	383	
1887.073		328.47	6.95			

Bessel 14. (46.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887.073	h. 3.8	° 257.18	′′ 49.64	3	383	14th mag.
7.075	3.8	256.50	49.95	2	383	
1887.074		256.84	49.80			

Bessel 20. (47.)

1887.073	4.1	295.62	100.17	3	383	13th mag.
7.075	3.4	295.48	100.30	3	383	
1887.074		295.55	100.24			

Bessel 20. (48.)

1887.073	4.3	189.50	128.28	3	383	13th mag.
7.075	3.6	189.25	128.65	2	383	
1887.074		189.38	128.46			

Bessel 3. (49.)

1887.084	3.5	130.40	79.20	2	383	14th mag.
7.119	4.3	130.00	78.07	2	383	
1887.102		130.20	78.64			

Bessel 3. (50.)

1887.084	3.7	174.30	158.81	2	383	13th mag.
7.119	4.3	173.72	157.74	3	383	
1887.102		174.01	158.28			

Bessel 5. (51.)

1887.084	4.1	357.82	120.34	2	383	12th mag.
7.119	4.5	357.58	120.92	2	383	
7.130	4.4	357.88	120.80	2	383	
1887.111		357.76	120.69			

Bessel 5. (52.)

1887.084	4.3	137.75	145.31	2	383	14th mag.
7.119	4.7	137.78	145.21	2	383	
1887.102		137.76	145.26			

Bessel 12. (53.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887. 122	h. 4. 2	° 320. 08	" 163. 77	3	383	14th mag.
7. 130	4. 7	319. 92	164. 11	3	383	
1887. 126		320. 00	163. 94			

Bessel 17. (54.)

1887. 122	4. 5	178. 50	114. 91	3	383	14th mag.
7. 130	5. 2	178. 45	114. 64	2	383	
1887. 126		178. 48	114. 78			

Bessel 17. (55.)

1887. 122	4. 7	335. 90	141. 23	3	383	12th mag.
7. 130	4. 9	335. 95	141. 31	2	383	
1887. 126		335. 92	141. 27			

Bessel 50. (56.)

1887. 133	4. 4	55. 42	62. 94	2	383	11th-12th mag.
7. 138	4. 5	55. 80	62. 83	3	383	
1887. 136		55. 61	62. 89			

Bessel 50. (57.)

1887. 133	4. 6	218. 40	1. 24	2	383	11th-12th mag.; foggy.
7. 138	4. 7	218. 75	40. 86	3	383	
1887. 136		218. 58	41. 05			

Bessel 15. (58.)

1887. 138	5. 3	8. 85	18. 56	2	383	14th mag.; fog. 15th mag.
7. 147	4. 9	9. 20	18. 32	3	383	
1887. 142		9. 02	18. 44			

Bessel 18. (59.)

1887. 138	5. 7	37. 28	115. 15	2	383	14th mag.; fog.
7. 147	5. 1	37. 50	115. 64	3	383	
1887. 142		37. 39	115. 40			

Bessel 31. (60.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1887. 138	h. 6. 0	° 263. 22	′ 5. 78	2	383	12th mag.; haze.
7. 147	5. 3	261. 22	5. 67	3	383	11th mag.
7. 152	5. 1	262. 70	6. 27	2	383	Windy.
1887. 146		262. 38	5. 91			

Bessel 31. (61.)

1887. 147	5. 4	174. 90	59. 28	3	383	14th mag.
7. 152	5. 3	174. 75	59. 03	2	383	
1887. 150		174. 82	59. 16			

Bessel 40. (62.)

1887. 147	5. 7	234. 78	77. 38	2	383	14th mag.
7. 152	5. 5	235. 10	77. 60	2	383	Windy.
1887. 150		234. 94	77. 49			

Bessel 40. (63.)

1887. 147	5. 8	332. 68	78. 32	2	383	15th mag.
7. 152	5. 7	332. 88	78. 67	2	383	15th-16th mag.
1887. 150		332. 78	78. 50			

Lalande 7655.

$$\alpha = 4^{\text{h}} 1^{\text{m}}.3 \quad \delta = 19^{\circ} 20' \quad (8 \text{ and } 11.)$$

1889. 975	2. 7	276. 6	5. 82	3	383	
89. 991	2. 9	276. 6	6. 27	2	383	Faint, hazy; $s \frac{1}{2}$ wt.
90. 041	2. 3	277. 1	5. 90	3	383	
1890. 002		276. 77	5. 942			No motion.

Σ 494.

$$\alpha = 4^{\text{h}} 1^{\text{m}}.8 \quad \delta = 22^{\circ} 46' \quad (7 \text{ and } 8.)$$

1889. 066	3. 2	187. 7	5. 28	2	383	
9. 107	3. 8	186. 9	5. 24	2	383	
1889. 086		187. 30	5. 260			No motion.

Σ 511.

$$\alpha = 4^{\text{h}} 7^{\text{m}}.9 \quad \delta = 58^{\circ} 32' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1890. 911	h. 0. 1	273. 2	0. 42	3	606	
0. 952	0. 8	274. 2	0. 37	3	888	
0. 958	0. 3	272. 6	0. 37	2	888	
1890. 940		273. 33	0. 387			A slow motion in angle.

G. A. 5.

$$\alpha = 4^{\text{h}} 8^{\text{m}}.0 \quad \delta = 29^{\circ} 45' \quad (9 \text{ and } 11.)$$

1889. 950	2. 2	243. 5	2. 49	3	383	
9. 975	2. 3	243. 6	2. 72	3	383	Clock running fast.
9. 991	2. 6	241. 5	2. 68	2	383	
1889. 972		242. 87	2. 630			

39 Eridani.

$$\alpha = 4^{\text{h}} 8^{\text{m}}.7 \quad \delta = -10^{\circ} 33' \quad (6 \text{ and } 9.)$$

1888. 135	4. 2	150. 0	6. 53	3	383	
8. 146	4. 6	150. 4	6. 52	2	383	
8. 149	4. 5	150. 0	6. 26	2	383	Cloudy.
1888. 142		150. 13	6. 437			Motion doubtful.

40 Eridani = Σ 518. A and B.

$$\alpha = 4^{\text{h}} 9^{\text{m}}.8 \quad \delta = -7^{\circ} 49' \quad (4 \text{ and } 10.)$$

1882. 103	4. 8	105. 85	82. 17	2	383	
2. 109	4. 9	105. 60	81. 92	3	383	
2. 134	5. 2	105. 62	82. 02	3	383	
1886. 109	4. 8	105. 42	82. 13	2	383	
6. 112	4. 4	105. 52	81. 96	2	383	
6. 153	4. 6	105. 60	81. 86	2	383	
1888. 088	4. 5	105. 62	81. 93	3	383	
8. 091	4. 2	105. 70	81. 95	3	383	
8. 121	4. 7	105. 65	82. 08	3	383	
1889. 063	3. 3	105. 58	81. 97	3	383	
9. 126	3. 7	105. 42	82. 13	2	383	
9. 142	4. 6	105. 62	81. 94	2	606	
9. 156	4. 5	105. 55	82. 01	3	383	

40 Eridani = Σ 518. *A* and *B*—Continued.

$$\alpha = 4^{\text{h}} 9^{\text{m}}.8 \quad \delta = -7^{\circ} 49' \quad (4 \text{ and } 10.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	"			
1891.015	3.8	105.45	82.14	2	383	
1.040	4.6	105.40	82.08	3	383	
1.054	3.7	105.52	82.09	2	383	
1.075	4.2	105.52	82.07	3	383	
1882.115		105.69	82.037			
1886.125		105.51	81.983			
1888.100		105.66	81.987			
1889.122		105.54	82.012			
1891.046		105.47	82.095			(Corrected for differential refraction.)

40 Eridani = Σ 518. *A* and *D*. (4 and 12.)

1882.103	5.1	117.78	35.37	2	383	
2.134	5.0	117.40	35.31	3	383	
1886.109	4.9	94.1	40.60	2	383	
6.112	4.6	94.1	40.31	2	383	
6.153	5.0	93.95	40.46	2	383	
1888.088	4.7	85.0	45.19	3	383	
8.091	4.4	84.8	44.84	3	383	
8.121	4.6	84.4	44.78	3	383	
1882.118		117.59	35.340			
1886.125		94.05	40.457			<i>D</i> is probably fixed, and not a member of this system.
1888.100		84.73	44.937			(Corrected for differential refraction.)

40 Eridani = Σ 518. *B* and *C*. (10 and 11.)

1882.103	4.7	118.9	3.19	2	383	
2.134	4.8	117.4	3.30	4	383	
1883.687	3.6	115.2	3.15	3	383	
3.925	4.5	116.4	3.05	3	383	
1886.005	3.7	111.6	3.05	2	383	Faint.
6.038	4.9	112.6	3.06	3	383	
6.109	4.6	112.0	2.91	3	383	
6.112	4.3	112.1	3.00	2	383	
6.147	5.6	112.0	2.94	2	383	
6.153	4.8	113.1	3.04	2	383	
1888.088	4.4	107.1	3.03	3	383	
8.091	4.0	107.7	3.32	3	383	Faint, hazy.
8.121	4.4	107.5	2.79	3	383	
8.124	4.5	106.5	3.03	3	383	
8.176	5.3	109.6	3.04	3	383	

40 Eridani = Σ 518. *B* and *C*—Continued.

$$\alpha = 4^{\text{h}} 9^{\text{m}}.8 \quad \delta = 7^{\circ} 49' \quad (4 \text{ and } 10.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1889. 063	3. 1	104. 1	2. 99	3	383	Faint.
9. 126	4. 0	103. 9	2. 80	2	606	
9. 142	4. 5	102. 1	2. 68	2	606	
9. 156	4. 7	104. 1	2. 70	3	383	Faint.
1891. 015	4. 0	99. 6	2. 56	2	606	
1. 040	4. 4	99. 0	2. 80	3	383	
1. 054	3. 5	100. 2	2. 66	2	383	Faint.
1. 075	4. 1	95. 8	2. 58	2	606	
1. 092	4. 0	98. 2	2. 64	2	606	
1882. 118		118. 15	3. 245			The stars <i>A B C</i> form a remarkable system.
1883. 806		115. 80	3. 100			
1886. 094		112. 23	3. 000			
1888. 120		107. 68	3. 042			
1889. 122		103. 55	2. 792			
1891. 055		98. 56	2. 648			

 Σ 520.

$$\alpha = 4^{\text{h}} 10^{\text{m}}.9 \quad \delta = 22^{\circ} 29' \quad (8 \text{ and } 8.)$$

1889. 142	4. 3	108. 7	0. 92	3	383	Windy.
9. 156	4. 9	113. 0	0. 79	3	383	
9. 184	5. 6	112. 7	0. 76	3	383	
1889. 161		111. 47	0. 823			Motion doubtful.

 φ Tauri.

$$\alpha = 4^{\text{h}} 13^{\text{m}}.0 \quad \delta = 27^{\circ} 4' \quad (5 \text{ and } 8.)$$

1890. 952	2. 1	246. 9	53. 16	2	383	
0. 958	1. 2	246. 2	53. 17	2	383	
1890. 955		246. 55	53. 165			
	$\Delta \rho = +$	0. 01	+ 0. 017			
		246. 56	53. 182			

W. IV. 258.

$$\alpha = 4^{\text{h}} 14^{\text{m}}.2 \quad \delta = 39^{\circ} 36' \quad (8 \text{ and } 12.)$$

1890. 911	0. 4	170. 7	19. 51	3	383	
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Σ 536.

$$\alpha = 4^{\text{h}} 16^{\text{m}}.2 \quad \delta = -4^{\circ} 58' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h	°	′			
1888. 124	4. 7	162. 3	1. 45	3	383	
8. 127	4. 3	161. 9	1. 60	2	383	
8. 132	4. 4	162. 6	1. 64	3	383	
1888. 128		162. 27	1. 563			Probably a slow motion.

 Σ 535.

$$\alpha = 4^{\text{h}} 16^{\text{m}}.5 \quad \delta = 11^{\circ} 5' \quad (7 \text{ and } 8.)$$

1888. 135	4. 4	334. 3	1. 56	3	383	
8. 146	4. 8	334. 2	1. 56	2	383	
8. 149	4. 7	335. 0	1. 44	2	383	
1888. 143		334. 50	1. 520			Motion.

 $O\Sigma$ 82.

$$\alpha = 4^{\text{h}} 16^{\text{m}}.9 \quad \delta = 14^{\circ} 46' \quad (7 \text{ and } 8.)$$

1890. 999	1. 8	151. 2	0. 74	2	606	
1. 015	1. 6	150. 4	0. 85	3	606	
1. 023	1. 5	334. 6	0. 77	2	606	Blazing images.
1891. 010		151. 56	0. 790			Motion in angle.

 $O\Sigma$ 85.

$$\alpha = 4^{\text{h}} 26^{\text{m}}.8 \quad \delta = 48^{\circ} 10' \quad (8 \text{ and } 10.)$$

1890. 952	1. 5	25. 1	1. 48	3	606	
0. 958	0. 9	25. 7	1. 53	2	606	Companion is 12th magnitude.
1890. 955		25. 40	1. 505			

 Σ 567.

$$\alpha = 4^{\text{h}} 29^{\text{m}}.5 \quad \delta = 19^{\circ} 14' \quad (9 \text{ and } 9.)$$

1890. 999	2. 9	321. 2	1. 85	3	383	
1891. 015	2. 0	321. 9	1. 80	2	606	Windy,
1891. 007		321. 55	1. 825			Motion.

Anonyma.

$$\alpha = 4^{\text{h}} 29^{\text{m}}.5 \quad \delta = 19^{\circ} 29' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1882.090	h. 4.2	° 68.3	" 0.54	3	606	This star was discovered by Prof. C. S. HASTINGS.
2.103	4.4	68.7	0.54	3	606	
2.109	4.6	66.6	0.55	3	888	
2.150	5.3	64.7	0.55	3	606	
1890.999	3.2	65.2	0.49	3	606	Windy.
1.015	1.9	60.1	0.57	2	606	
1.029	2.5	62.7	0.51	3	606	
1882.113		67.07	0.545			Perhaps motion.
1891.014		62.62	0.523			

Σ 566.

$$\alpha = 4^{\text{h}} 30^{\text{m}}.5 \quad \delta = 53^{\circ} 15' \quad (6 \text{ and } 8.)$$

1890.952	1.1	287.3	1.68	3	606	A slow motion in angle.
0.958	0.6	288.3	1.70	2	606	
1890.955		277.80	1.690			

Σ 572.

$$\alpha = 4^{\text{h}} 31^{\text{m}}.1 \quad \delta = 26^{\circ} 42' \quad (7 \text{ and } 7.)$$

1890.969	1.7	200.8	3.59	3	606	A slow motion in angle.
0.977	1.0	202.3	3.68	2	383	
0.982	1.1	201.8	3.62	3	383	
1890.976		201.63	3.630			

Σ 577.

$$\alpha = 4^{\text{h}} 34^{\text{m}}.1 \quad \delta = 47^{\circ} 15' \quad (8 \text{ and } 8.)$$

1890.969	1.5	74.3	1.49	3	606	Clouds.
0.977	0.3	76.0	1.54	2	606	
0.982	0.6	76.5	1.45	2	606	
1890.976		75.60	1.493			A slow motion in angle.

Anonyma.

$$\alpha = 4^{\text{h}} 38^{\text{m}}.0 \quad \delta = 1^{\circ} 51' \quad (9 \text{ and } 10.)$$

1888.088	4.9	158.0	2.24	3	383	
8.091	4.7	158.2	2.41	3	383	
8.135	4.6	157.5	2.22	3	383	
1888.105		157.90	2.290			

Σ 589.

$$\alpha = 4^{\text{h}} 38^{\text{m}}.5 \quad \delta = 5^{\circ} 4' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 124	h. 4.9	° 300.1	// 4.55	2	383	
8. 127	4.5	299.5	4.62	2	383	
8. 132	4.6	300.0	4.55	3	383	
1888. 128		299.87	4.573			Motion doubtful.

Lalande 9065.

$$\alpha = 4^{\text{h}} 42^{\text{m}}.5 \quad \delta = -21^{\circ} 0' \quad (8 \text{ and } 10.)$$

1888. 135	4.8	345.3	3.61	2	383	Blurred.
8. 146	5.0	346.1	2.95	2	383	Blurred.
8. 162	5.1	345.9	3.24	3	383	
1888. 148		345.80	3.260			No motion.

Lalande 9181.

$$\alpha = 4^{\text{h}} 46^{\text{m}}.8 \quad \delta = -5^{\circ} 29' \quad (9 \text{ and } 9.3.)$$

1888. 135	5.1	176.6	1.09	3	383	
8. 146	5.2	359.4	1.06	2	383	
8. 162	5.4	359.9	0.88	3	383	
1888. 148		178.63	1.010			No motion.

O Σ 91.

$$\alpha = 4^{\text{h}} 49^{\text{m}}.9 \quad \delta = 3^{\circ} 0' \quad (8 \text{ and } 9.)$$

1890. 999	3.4	239.8	0.61	3	606	
1. 015	2.8	241.9	0.55	2	606	
1891. 007		240.85	0.580			No motion.

 Σ 622.

$$\alpha = 4^{\text{h}} 51^{\text{m}}.9 \quad \delta = 1^{\circ} 29' \quad (8 \text{ and } 8.)$$

1888. 124	5.2	354.2	2.41	2	383	
8. 127	4.6	353.7	2.60	2	383	
8. 132	4.8	353.9	2.41	3	383	
1888. 128		353.93	2.473			Perhaps motion in angle.

OΣ 92.

$$\alpha = 4^{\text{h}} 52^{\text{m}}.1 \quad \delta = 39^{\circ} 13' \quad (6 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1890.982	h. 2.5	° 250.3	// 2.62	2	383	Faint.
0.999	1.3	251.1	2.76	3	383	
1890.990		250.70	2.690			A slow motion in angle.

OΣ 95.

$$\alpha = 4^{\text{h}} 59^{\text{m}}.5 \quad \delta = 19^{\circ} 41' \quad (7 \text{ and } 8.)$$

1890.999	3.6	331.0	0.92	2	606	A slow motion in angle.
1.015	2.3	329.4	0.90	2	606	
1891.007		330.20	0.910			

OΣ 98.

$$\alpha = 5^{\text{h}} 1^{\text{m}}.3 \quad \delta = 8^{\circ} 20' \quad (6 \text{ and } 7.)$$

1891.040	4.8	191.2	1.10	2	606	A motion in angle.
1.054	3.2	188.4	0.96	2	606	
1.056	2.5	186.2	0.95	3	606	
1891.050		188.60	1.003			

Σ 634.

$$\alpha = 5^{\text{h}} 2^{\text{m}}.8 \quad \delta = 79^{\circ} 5' \quad (5 \text{ and } 8.)$$

1890.976	0.7	8.2	16.04	2	383	Blazing images.
0.982	0.9	8.4	16.04	3	383	
1890.980	$\Delta p =$	8.33	16.040			Motion.
		+ 0.09	+ 0.005			
		8.42	16.045			

OΣ 517.

$$\alpha = 5^{\text{h}} 7^{\text{m}}.0 \quad \delta = 1^{\circ} 50' \quad (6 \text{ and } 13.)$$

1888.162	5.6	137.7	6.87	3	383	Not OΣ 517.
8.176	5.5	138.8	6.93	3	383	
1888.169		138.25	6.900			

ρ Orionis.

$a = 5^h 7^m.0 \quad \delta = 2^\circ 43' \quad (5 \text{ and } 8.)$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 124	h. 5.4	° 64.5	// 6.92	3	383	No motion.
8. 127	4.8	64.5	6.95	2	383	
8. 132	4.9	66.0	6.83	2	383	
1888. 128		65.00	6.900			

Rigel.

$a = 5^h 8^m.8 \quad \delta = -8^\circ 20' \quad (1 \text{ and } 8.)$

1888. 127	5.0	201.5	9.61	3	383	
8. 132	5.1	202.3	9.94	2	383	
8. 135	5.2	201.9	9.55	3	383	
8. 146	5.4	202.6	9.85	2	383	
1888. 135		202.08	9.738			

Σ 676.

$a = 5^h 13^m.1 \quad \delta = 64^\circ 38' \quad (7 \text{ and } 9.)$

1890. 982	2.1	274.6	1.06	2	606	Cloudy. Perhaps motion.
0. 999	0.9	274.2	1.00	3	606	
1. 010	2.3	273.8	0.98	2	606	
1890. 997		274.20	1.013			

Σ 677.

$a = 5^h 13^m.5 \quad \delta = 63^\circ 16' \quad (8 \text{ and } 8.)$

1890. 982	2.2	252.8	1.77	2	606	Motion.
0. 999	1.1	254.1	1.44	3	606	
1. 015	1.3	253.9	1.63	3	606	
1890. 999		253.60	1.013			

ϵ Orionis.

$a = 5^h 16^m.5 \quad \delta = 3^\circ 26' \quad (5 \text{ and } 7.)$

1888. 132	5.4	28.5	32.05	2	383	No motion.
8. 135	5.4	28.5	32.01	3	383	
1888. 134	$\Delta p =$	28.50	32.030			
		0.00	+ 0.011			
		28.50	32.041			

Σ 694.

$$\alpha = 5^{\text{h}} 16^{\text{m}}.6 \quad \delta = 24^{\circ} 51' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	o	//			
1885. 144	4. 8	4. 5	1. 37	3	383	
5. 147	4. 8	5. 6	1. 24	3	383	
5. 150	4. 5	3. 8	1. 49	3	383	
1886. 210	6. 2	185. 8	1. 43	3	383	
6. 213	6. 5	183. 3	1. 14	2	383	
1890. 158	5. 2	184. 0	1. 25	3	383	
0. 180	5. 8	184. 4	1. 24	3	383	
0. 186	5. 7	185. 2	1. 23	2	383	
1885. 147		4. 63	1. 367			
1886. 212		184. 55	1. 285			
1890. 175		184. 53	1. 240			No motion.

 η Orionis.

$$\alpha = 5^{\text{h}} 18^{\text{m}}.4 \quad \delta = -2^{\circ} 31' \quad (3 \text{ and } 6.)$$

1886. 210	6. 4	84. 9	1. 05	3	383	
6. 213	6. 8	86. 1	0. 99	2	606	
1888. 187	5. 4	89. 3	1. 21	2	383	
8. 190	6. 0	88. 8	1. 07	2	383	
8. 206	6. 0	84. 3	1. 10	3	383	
1886. 212		85. 50	1. 020			
1888. 194		87. 47	1. 127			

Oel. Arg. S. 3957.

$$\alpha = 5^{\text{h}} 21^{\text{m}}.3 \quad \delta = -20^{\circ} 49' \quad (8 \text{ and } 11.)$$

1891. 056	4. 9	231. 5	4. 25	3	383	
1. 075	4. 6	228. 0	4. 34	2	383	
1891. 066		229. 75	4. 295			No motion.

118 Tauri = Σ 716.

$$\alpha = 5^{\text{h}} 21^{\text{m}}.9 \quad \delta = 15^{\circ} 3' \quad (7 \text{ and } 8.)$$

1885. 150	5. 0	201. 0	4. 92	3	383	
5. 155	5. 0	202. 0	4. 94	3	383	
5. 169	5. 2	199. 7	5. 07	2	383	
1886. 210	6. 7	202. 0	5. 02	3	383	
6. 213	7. 0	201. 2	5. 00	2	606	
1885. 158		200. 90	4. 977			
1886. 212		201. 60	5. 010			Perhaps motion.

Σ 719. *A* and *B*.

$$\alpha = 5^{\text{h}} 22^{\text{m}}.4 \quad \delta = 29^{\circ} 30' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1886. 210	h. 7.0	° 329.4	// 0.99	2	606	Perhaps motion.
6. 213	7.2	332.9	0.95	2	606	
1886. 212		331.15	0.970			

 Σ 719. *A* and *C*.

1886. 210	7. 2	350. 4	15. 21	2	383	
6. 213	7. 3	350. 7	15. 15	2	606	
1886. 212	$\Delta\rho=$	350. 55	15. 180			
		0. 00	+ 0. 008			
		350. 55	15. 180			

 β Leporis.

$$\alpha = 5^{\text{h}} 23^{\text{m}}.7 \quad \delta = -20^{\circ} 51' \quad (3 \text{ and } 11.)$$

1882. 090	4.6	279.7	2.74	2	383	Hazy.
2. 103	6.0	285.2	2.73	3	383	
2. 134	5.5	282.4	2.63	2	383	
1891. 117	4.8	280.5	2.91	3	383	
1. 125	4.7	283.7	2.88	2	383	
1882. 109		282.43	2.700			No motion.
1891. 121		282.10	2.895			

 Σ 735.

$$\alpha = 5^{\text{h}} 27^{\text{m}}.0 \quad \delta = -6^{\circ} 35' \quad (8 \text{ and } 9.)$$

1888. 187	5. 8	352. 5	39. 48	3	383	Motion in distance.
8. 190	6. 3	352. 3	39. 62	3	383	
1888. 188	$\Delta p =$	352. 40	39. 550			
		0. 00	+ 0. 022			
		352. 40	39. 572			

 λ Orionis = Σ 738.

$$\alpha = 5^{\text{h}} 28^{\text{m}}.5 \quad \delta = 9^{\circ} 51' \quad (4 \text{ and } 6.)$$

1885. 150	5.3	46.7	4.29	3	383	
5. 155	5.2	47.4	4.32	3	383	
5. 169	5.4	48.2	4.41	2	383	

λ **Orionis** = Σ **738**—Continued.

$$a = 5^{\text{h}} 28^{\text{m}}.5 \quad \delta = 9^{\circ} 51' \quad (4 \text{ and } 6.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	//			
1888. 149	4.9	46.2	4.45	2	383	
8. 162	5.8	43.3	4.41	3	383	
8. 176	5.7	44.3	4.45	3	383	
8. 182	5.9	42.2	4.47	3	383	
1885. 158		47.43	4.340			
1888. 190		44.00	4.445			Motion doubtful.

 Σ **742.**

$$a = 5^{\text{h}} 29^{\text{m}}.2 \quad \delta = 21^{\circ} 55' \quad (7 \text{ and } 8.)$$

1890. 186	5.9	257.6	3.46	2	383	
0. 188	6.1	257.0	3.44	3	383	
0. 197	6.1	258.1	3.33	3	383	Windy.
1890. 190		257.57	3.410			A slow motion.

 σ **Orionis.** *A* and *B.*

$$a = 5^{\text{h}} 32^{\text{m}}.7 \quad \delta = -2^{\circ} 40' \quad (4 \text{ and } 10.)$$

1888. 162	6.2	84.9	12.92	3	383	
8. 176	6.0	84.7	12.74	2	383	
1888. 169	$\Delta\rho =$	84.80	12.830			
		0.00	+ 0.006			
		84.80	12.836			

 σ **Orionis.** *A* and *C.*

1888. 162	6.0	236.8	11.48	3	383	
8. 176	5.9	237.2	11.44	2	383	
1888. 169	$\Delta\rho =$	237.00	11.460			
		0.00	+ 0.006			
		237.00	11.466			

ζ Orionis = Σ 774.

$$\alpha = 5^{\text{h}} 34^{\text{m}}.7 \quad \delta = -2^{\circ} 0' \quad (2 \text{ and } 6.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1885. 150	6. 0	154. 3	2. 79	2	383	
5. 172	5. 8	155. 1	2. 68	2	383	
5. 232	7. 2	153. 9	3. 00	2	383	
1888. 135	5. 6	155. 3	2. 66	2	383	
8. 182	6. 1	158. 1	2. 69	3	383	
8. 184	5. 3	156. 6	2. 64	2	383	
1885. 185		154. 43	2. 823			
1888. 167		156. 67	2. 663			A slow motion.

 Σ 787.

$$\alpha = 5^{\text{h}} 38^{\text{m}}.8 \quad \delta = 21^{\circ} 16' \quad (8 \text{ and } 9.)$$

1890. 158	5. 5	74. 0	1. 14	3	383	
0. 180	6. 0	73. 8	1. 11	3	383	
1890. 169		73. 90	1. 125			Motion doubtful.

 γ Leporis.

$$\alpha = 5^{\text{h}} 39^{\text{m}}.2 \quad \delta = -22^{\circ} 29' \quad (4 \text{ and } 8.)$$

1889. 186	5. 8	349. 60	95. 15	2	383	
9. 195	5. 7	349. 58	95. 12	3	383	
1889. 190		349. 59	95. 135			
	$\Delta\rho =$	+ 0. 01	+ 0. 112			
		349. 60	95. 247			

G. A. 2.

$$\alpha = 5^{\text{h}} 47^{\text{m}}.0 \quad \delta = -20^{\circ} 0' \quad (8 \text{ and } 11.)$$

1889. 184	5. 9	20. 3	9. 04	2	383	
9. 186	6. 0	20. 7	9. 04	2	383	
1889. 185		20. 50	9. 040			

South 503.

$$\alpha = 5^{\text{h}} 49^{\text{m}}.1 \quad \delta = 13^{\circ} 56' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1888. 187	6. 1	17. 0	2. 96	3	383	Misty Faint.
8. 190	6. 5	16. 7	2. 93	3	383	
1890. 156	5. 6	1. 0	3. 88	3	383	
0. 158	4. 9	0. 3	4. 03	3	383	
0. 175	5. 5	359. 9	3. 91	2	383	
0. 180	5. 5	0. 1	3. 86	3	383	
1888. 188		16. 85	2. 945			Proper motion.
1890. 167		0. 32	3. 920			

41 Aurigæ.

$$\alpha = 6^{\text{h}} 2^{\text{m}}.4 \quad \delta = 48^{\circ} 44' \quad (5 \text{ and } 6.)$$

1890. 158	5. 8	354. 3	7. 96	3	383	No motion.
0. 186	6. 2	353. 8	7. 96	2	383	
0. 188	6. 4	354. 6	7. 87	2	383	
1890. 177		354. 23	7. 930			

 Σ 853.

$$\alpha = 6^{\text{h}} 2^{\text{m}}.5 \quad \delta = 11^{\circ} 41' \quad (8 \text{ and } 8.)$$

1885. 180	6. 2	351. 32	27. 57	2	383	Proper motion.
5. 232	7. 4	350. 55	27. 57	3	383	
5. 235	7. 4	351. 32	27. 68	3	383	
1885. 216	$\Delta \rho =$	351. 06	27. 607			
		0. 00	+ 0. 011			
		351. 06	27. 618			

 η Geminorum.

$$\alpha = 6^{\text{h}} 7^{\text{m}}.6 \quad \delta = 22^{\circ} 32' \quad (4 \text{ and } 10.)$$

1883. 240	7. 6	298. 1	0. 85	2	606	Discovered by A. G. CLARK.
3. 259	7. 6	299. 4	0. 80	2	606	
3. 284	8. 3	299. 9	0. 77	2	606	
3. 287	8. 4	303. 5	0. 89	2	606	
1883. 268		300. 22	0. 828			

Lalande 11915.

$$\alpha = 6^{\text{h}} 8^{\text{m}}.7 \quad \delta = -1^{\circ} 41' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 182	h 6.3	° 97.0	" 2.14	3	383	No motion.
8. 184	5.7	95.7	2.13	3	383	
1888. 183		96.35	2.135			

Σ 881.

$$\alpha = 6^{\text{h}} 11^{\text{m}}.4 \quad \delta = 59^{\circ} 26' \quad (6 \text{ and } 8.)$$

1891. 054	4.0	105.6	0.80	2	606	8th and 9th magnitudes.
1. 056	2.8	100.5	0.80	3	606	Cloudy.
1. 064	2.8	103.4	0.78	2	606	
1891. 058		103.17	0.793			Perhaps a slow motion in angle.

Lalande 12148.

$$\alpha = 6^{\text{h}} 15^{\text{m}}.8 \quad \delta = 17^{\circ} 38' \quad (8 \text{ and } 9.)$$

1885. 155	5.5	24.9	2.36	3	383	
5. 169	5.7	23.9	2.27	2	383	
5. 172	6.1	20.6	2.36	3	383	
1886. 210	7.5	21.1	2.31	3	383	
6. 224	7.2	22.1	2.29	2	383	
1885. 165		23.13	2.330			Discovered by J. R. EASTMAN.
1886. 217		21.60	2.300			

11 Monocerotis. A and B.

$$\alpha = 6^{\text{h}} 23^{\text{m}}.0 \quad \delta = -6^{\circ} 57' \quad (5 \text{ and } 6.)$$

1888. 182	6.5	131.1	7.44	2	383	
8. 184	5.9	130.5	7.37	3	383	
1888. 183		130.80	7.405			

11 Monocerotis. B and C.

1888. 182	6.7	104.6	2.79	2	383	A faint companion 15th mag.; $p = 50^{\circ}$; $s = 25''$.
8. 184	6.1	102.3	2.62	3	383	
1888. 183		103.45	2.705			

G. A. 3. *A* and *D*.

$$a = 6^h 24^m.0 \quad \delta = 5^\circ 0' \quad (8.9 \text{ and } 13.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1891. 114	h. 5.8	° 287.6	" 13.19	2	383	Cloudy.
1. 117	5.7	286.4	12.87	3	383	
1891. 116		287.00	13.030			

G. A. 3. *A* and *E*.

$$a = 6^h 24^m.0 \quad \delta = 5^\circ 0' \quad (8.9 \text{ and } 13.)$$

1891. 114	5.6	197.6	13.49	2	383	
1. 117	5.5	198.2	13.56	3	383	
1891. 116		197.90	13.525			

Σ 932.

$$a = 6^h 27^m.5 \quad \delta = 14^\circ 50' \quad (8 \text{ and } 9.)$$

1885. 155	5.7	330.6	2.26	3	383	
5. 169	5.9	327.2	2.07	2	383	
5. 172	7.3	328.2	2.16	3	383	
1886. 210	7.8	329.5	2.11	3	383	
6. 224	7.4	327.8	2.08	2	383	
1885. 165		328.67	2.163			
1886. 217		328.65	2.095			A slow motion.

OΣ 149.

$$a = 6^h 28^m.8 \quad \delta = 27^\circ 23' \quad (7 \text{ and } 9.)$$

1882. 090	5.2	304.1	0.74	2	606	
2. 134	5.9	293.7	0.83	2	888	
2. 150	5.6	304.3	0.75	2	606	
1891. 092	4.3	286.8	0.51	2	888	
1. 125	4.4	292.5	0.72	2	606	
1. 190	6.1	286.3	0.75	2	606	
1882. 125		300.70	0.773			A motion in angle.
1891. 136		288.53	0.660			

OΣ 152.

$$a = 6^h 30^m.1 \quad \delta = 28^\circ 24' \quad (6 \text{ and } 8.)$$

1886. 210	8.1	37.1	0.81	2	606	15 inches aperture.
6. 270	8.0	37.1	0.83	2	606	
6. 273	8.4	38.5	0.88	2	606	
1886. 251		37.57	0.840			Motion doubtful.

Σ 945.

$$\alpha = 6^{\text{h}} 31^{\text{m}}.9 \quad \delta = 41^{\circ} 7' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1891.075	h. 3.2	° 267.3	'' 0.90	2	606	A slow motion in angle.
1.092	3.7	266.4	0.67	3	606	
1.097	3.6	267.8	0.69	2	606	
1891.088		267.17	0.753			

 Σ 950. A and B .

$$\alpha = 6^{\text{h}} 33^{\text{m}}.4 \quad \delta = 10^{\circ} 1' \quad (6 \text{ and } 9.)$$

1885.232	7.7	212.7	2.75	2	383	Clouds.
5.235	7.7	211.5	2.85	2	383	
1886.210	8.5	214.5	3.00	2	383	Blurred images.
6.224	7.7	211.8	3.11	2	383	
6.229	6.8	213.7	2.82	3	383	
1885.234		212.10	2.800			Perhaps motion in angle.
1886.220		213.64	2.950			

 Σ 950. A and C . (6 and 13.)

1886.210	8.7	13.5	16.15	2	383	
6.229	7.0	13.6	16.49	3	383	
1886.220	$\Delta \rho =$	13.55	16.320			
		0.00	+ 0.007			
		13.55	16.327			

 $O\Sigma$ 154.

$$\alpha = 6^{\text{h}} 33^{\text{m}}.7 \quad \delta = 40^{\circ} 47' \quad (7 \text{ and } 8.)$$

1891.073	3.5	125.95	26.71	2	606	Motion in distance.
1.083	3.6	126.20	26.83	2	383	
1891.078	$\Delta \rho =$	126.08	26.770			
		0.00	+ 0.009			
		126.08	26.779			

 Σ 955. A and B .

$$\alpha = 6^{\text{h}} 35^{\text{m}}.4 \quad \delta = -7^{\circ} 53' \quad (9 \text{ and } 9.)$$

1889.195	6.2	271.8	0.93	2	605	No motion.
9.197	6.1	270.2	0.96	3	606	
9.200	6.5	272.6	0.96	2	606	
1889.197		271.53	0.950			

$$\Sigma \mathbf{955.} \quad \frac{AB}{2} \text{ and } C. \quad (9 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889. 195	h. 6. 4	° 189. 3	// 11. 68	2	606	
9. 197	6. 3	188. 3	11. 46	3	606	
9. 200	6. 7	188. 3	11. 55			
1889. 197		188. 63	11. 563			
	$\Delta p =$	0. 00	+ 0. 007			
		188. 63	11. 570			

$$\Sigma \mathbf{948 = 12 \text{ Lyncis.} \quad A \text{ and } B.}$$

$$a = 6^{\text{h}} 35^{\text{m}}.6 \quad \delta = 59^{\circ} 34' \quad (6 \text{ and } 7.)$$

1891. 056	3. 6	122. 6	1. 80	3	606	
1. 064	3. 1	122. 5	1. 61	2	606	
1. 075	2. 9	122. 4	1. 53	2	606	
1891. 065		122. 50	1. 647			Motion in angle.

$$\Sigma \mathbf{948 = 12 \text{ Lyncis.} \quad A \text{ and } C.}$$

$$a = 6^{\text{h}} 35^{\text{m}}.6 \quad \delta = 59' 34' \quad (6 \text{ and } 8.)$$

1891. 056	3. 8	303. 4	8. 67	3	606	
1. 064	3. 2	305. 6	8. 72	2	606	Cloudy.
1. 075	3. 0	304. 4	8. 62	2	606	
1891. 065		304. 47	8. 670			Probably a triple system.

56 Aurigæ.

$$a = 6^{\text{h}} 38^{\text{m}}.1 \quad \delta = 43^{\circ} 42' \quad (6 \text{ and } 9.)$$

1890. 158	6. 0	22. 33	46. 50	3	383	
0. 186	6. 5	22. 32	46. 37	2	383	
0. 188	7. 3	22. 38	46. 41	3	383	
1890. 177		22. 34	46. 427			
	$\Delta p =$	. 00	+ 0. 013			
		22. 34	46. 440			Proper motion.

$$O\Sigma \mathbf{156.}$$

$$a = 6^{\text{h}} 38^{\text{m}}.6 \quad \delta = 18^{\circ} 21' \quad (7 \text{ and } 7.)$$

1888. 184	6. 3	305. 6	0. 65	2	606	
8. 187	6. 4	306. 9	0. 68	2	606	
1888. 186		306. 25	0. 665			Motion in angle.

Sirius.

$$\alpha = 6^{\text{h}} 39^{\text{m}}.9 \quad \delta = -16^{\circ} 33' \quad (1 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1880. 222	6. 6	48. 3	10. 45	2	383	Very unsteady and comp. faint.
o. 231	6. 8	47. 6	. . .	2	383	Very unsteady.
o. 233	6. 8	46. 3	10. 45	2	383	Unsteady.
o. 247	7. 4	49. 6	10. 21	2	383	Very bad images.
o. 250	7. 2	47. 4	10. 29	3	383	
o. 252	7. 3	47. 7	10. 30	3	383	
o. 264	7. 8	48. 2	10. 25	3	383	
o. 272	8. 0	47. 8	10. 27	3	383	Cloudy.
1881. 236	6. 9	45. 3	9. 99	2	383	Images unsteady.
1. 238	7. 0	44. 8	10. 17	2	383	Images unsteady.
1. 241	6. 9	45. 2	9. 88	3	383	
1. 268	8. 0	44. 5	10. 01	2	383	Very unsteady.
1. 276	8. 2	46. 3	10. 00	2	383	Very unsteady.
1. 279	8. 5	46. 7	9. 96	3	383	Faint.
1882. 224	7. 6	41. 9	. . .	2	383	Very unsteady; clouds.
2. 227	6. 5	42. 1	9. 53	3	383	Unsteady.
2. 229	7. 2	43. 9	9. 79	2	383	Very unsteady.
2. 232	6. 8	42. 2	9. 59	3	383	
2. 240	7. 2	42. 7	9. 70	2	383	Very unsteady.
2. 243	7. 1	41. 9	9. 61	3	383	
2. 248	7. 5	42. 7	9. 79	2	383	Unsteady.
1883. 201	6. 2	39. 8	9. 39	2	383	
3. 207	6. 2	38. 7	9. 12	3	383	
3. 210	6. 3	38. 3	9. 32	2	383	
3. 212	6. 2	39. 5	9. 19	3	383	
3. 218	6. 5	39. 4	9. 31	2	383	
3. 220	6. 6	38. 9	9. 23	2	383	
1884. 170	5. 6	39. 0	8. 89	2	383	Very faint.
4. 206	6. 1	38. 2	8. 76	2	383	Faint.
4. 209	6. 2	37. 5	8. 64	2	383	Faint.
4. 225	6. 8	36. 5	8. 72	2	383	Very faint.
4. 231	6. 7	37. 5	8. 87	3	383	
4. 247	7. 3	37. 8	8. 95	2	383	Faint.
4. 250	7. 4	37. 2	8. 87	2	383	
4. 269	7. 9	37. 8	8. 74	3	383	
1885. 219	6. 6	36. 3	7. 96	2	383	Very faint.
5. 233	6. 8	35. 2	8. 23	2	383	Faint.
5. 236	7. 0	35. 6	8. 17	2	383	Faint.
5. 252	7. 3	36. 3	. .	2	383	Faint; hazy.
5. 293	8. 7	34. 4	. .	2	383	Faint; hazy.
5. 301	8. 8	33. 9	7. 93	4	383	Double weight.
5. 304	9. 0	33. 8	8. 22	2	383	Very faint.
5. 307	9. 1	33. 2	7. 96	2	383	Faint.
1886. 180	5. 5	30. 7	7. 10	3	383	Faint.
6. 183	5. 5	32. 7	7. 56	2	383	Very faint.

Sirius—Continued.

$$\alpha = 6^{\text{h}} 39^{\text{m}}.9 \quad \delta = 16^{\circ} 33' \quad (1 \text{ and } 10.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$\circ$	$''$			
1886. 194	5.7	32.4	7.11	3	383	Faint.
6. 202	6.1	33.5	7.75	2	383	Faint.
6. 273	8.0	29.5	7.38	2	383	Faint; 15 inches aperture.
6. 295	8.6	28.1	7.40	2	383	15 inches aperture; faint.
1887. 190	8.3	24.0	6.56	3	383	Very faint.
7. 226	6.6	22.9	6.67	3	606	Faint.
7. 264	7.7	24.6	6.45	3	606	Faint.
7. 270	8.0	25.2	6.35	2	606	Faint.
1888. 190	5.8	22.8	5.80	3	383	Faint.
8. 269	8.0	22.2	5.89	2	383	Very faint; s uncertain.
8. 286	8.5	24.8	5.64	3	383	Extremely faint.
1880. 246		47.86	10.317			The observations became difficult in 1887, and more so in 1888, so that the measures of these years have not much weight. The companion was seen several times in 1889 with much difficulty, and as it could be observed easily with the larger telescopes, the observations here were discontinued.
1881. 257		45.47	10.002			
1882. 235		42.49	9.668			
1883. 211		39.10	9.260			
1884. 226		37.69	8.805			
1885. 272		34.73	8.057			
1886. 221		31.15	7.383			
1887. 239		24.18	6.508			
1888. 248		23.27	5.777			

 $\text{O}\Sigma$ 159.

$$\alpha = 6^{\text{h}} 46^{\text{m}}.9 \quad \delta = 58^{\circ} 34' \quad (5 \text{ and } 7.)$$

1891. 075	3.8	7.0	0.88	2	606	Motion in angle.
1. 092	3.4	7.7	0.80	3	606	
1. 097	3.4	7.9	0.76	2	606	
1891. 088		7.53	0.813			

38 Geminorum = Σ 982.

$$\alpha = 6^{\text{h}} 47^{\text{m}}.9 \quad \delta = 13^{\circ} 20' \quad (6 \text{ and } 8.)$$

1885. 155	6.0	162.1	6.46	2	383	A slow motion.
5. 169	6.2	163.4	6.42	2	383	
5. 172	7.9	162.1	6.54	3	383	
1885. 165		162.53	6.473			

Lalande 13404.

$$\alpha = 6^{\text{h}} 49^{\text{m}}.9 \quad \delta = 2^{\circ} 28' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 190	h. 6. 7	° 66. 7	// 0. 99	3	383	
8. 206	6. 3	65. 0	1. 10	3	383	
1888. 198		65. 85	1. 045			

 μ Canis Majoris.

$$\alpha = 6^{\text{h}} 50^{\text{m}}.6 \quad \delta = -13^{\circ} 53' \quad (5 \text{ and } 8.)$$

1887. 227	6. 9	339. 3	2. 86	3	383	
7. 229	7. 2	340. 6	2. 86	3	383	
7. 232	7. 3	339. 4	3. 03	2	383	
7. 254	7. 8	339. 9	2. 81	2	383	
7. 257	7. 5	339. 7	2. 82	3	383	
1887. 240		339. 78	2. 876			Perhaps a small motion.

 $\theta \Sigma 165.$

$$\alpha = 7^{\text{h}} 1^{\text{m}}.3 \quad \delta = 16^{\circ} 8' \quad (5 \text{ and } 7.)$$

1886. 971	4. 9	60. 7	3. 18	3	383	
7. 073	5. 3	60. 6	3. 52	2	383	Windy; faint.
7. 123	5. 3	60. 8	3. 24	3	383	
1887. 056		60. 70	3. 313			Motion.

 $\Sigma 1037.$

$$\alpha = 7^{\text{h}} 5^{\text{m}}.3 \quad \delta = 27^{\circ} 26' \quad (7 \text{ and } 9.)$$

1889. 195	6. 7	312. 7	1. 15	2	606	
9. 197	6. 5	310. 3	1. 04	3	606	
9. 200	5. 9	308. 8	1. 12	2	383	
1889. 197		310. 60	1. 103			A slow motion.

 δ Geminorum = $\Sigma 1066.$

$$\alpha = 7^{\text{h}} 12^{\text{m}}.8 \quad \delta = 22^{\circ} 11' \quad (3 \text{ and } 8.)$$

1887. 196	6. 9	206. 1	7. 28	2	383	
7. 205	6. 7	204. 5	7. 18	3	383	
7. 207	8. 3	206. 4	7. 17	3	383	
1887. 203		205. 67	7. 210			A very slow motion.

Σ 1093.

$$a = 7^h 21^m.2 \quad \delta = 50^\circ 13' \quad (9 \text{ and } 10.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1891. 190	h. 6.4	^o 135.8	// 0.72	3	606	Windy.
1. 201	6.3	135.9	0.73	2	606	
1. 204	6.3	135.2	0.70	3	606	
1891. 198		135.63	0.717			Motion in angle.

 $O\Sigma$ 175.

$$a = 7^h 26^m.8 \quad \delta = 31^\circ 13' \quad (6 \text{ and } 7.)$$

1888. 214	6.4	329.8	0.73	3	383	Very windy.
8. 247	7.3	336.0	0.70	2	606	
8. 253	7.4	336.5	0.71	2	606	
1888. 238		334.10	0.713			No motion.

Castor = Σ 1110. A and B.

$$a = 7^h 26^m.9 \quad \delta = 32^\circ 9' \quad (2 \text{ and } 3.)$$

1880. 114	6.4	234.3	5.66	3	383	Clouds.
0. 131	6.8	233.3	5.79	3	383	
0. 166	6.6	234.9	5.73	2	383	
0. 169	6.3	232.8	5.71	3	606	
0. 180	6.1	236.4	5.72	3	383	
0. 210	6.4	233.0	5.69	3	383	
1881. 290	8.5	234.5	5.86	2	383	
1. 292	8.6	233.6	5.90	2	383	
1. 311	9.1	234.4	5.99	2	383	
1. 325	9.4	233.9	5.52	2	383	
1. 328	9.4	233.8	5.74	2	606	
1. 331	9.2	235.2	5.77	3	383	
1882. 134	6.2	231.6	5.87	3	383	Images confused.
2. 150	5.9	233.1	5.77	2	383	
2. 199	7.9	232.7	5.86	2	383	
2. 227	6.9	233.4	5.58	2	383	
2. 232	7.1	234.1	5.73	3	383	Clouds.
1883. 284	9.1	234.0	5.80	2	606	
3. 298	9.4	234.7	5.94	2	383	
3. 306	9.2	233.7	5.81	2	383	
1885. 251	9.0	233.2	.	3	383	
5. 292	9.3	233.3	6.01	2	383	
5. 301	9.2	232.7	5.87	3	383	
5. 303	9.6	232.8	6.15	2	383	
5. 309	9.9	233.1	5.98	2	383	
5. 311	9.8	232.2	5.93	2	383	
5. 320	10.0	232.9	5.91	2	383	

Castor = Σ 1110. *A* and *B*—Continued.

$$a = 7^h 26^m.9 \quad \delta = 32^\circ 9' \quad (2 \text{ and } 3.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks
	h.	°	"			
1886. 290	9. 1	232. 5	5. 94	2	383	
6. 295	8. 9	233. 2	5. 92	2	383	
6. 322	9. 7	233. 4	5. 83	2	383	Hazy.
6. 328	9. 6	232. 4	5. 85	2	383	
1887. 227	8. 6	232. 3	5. 83	2	383	
7. 229	8. 1	232. 4	5. 91	2	383	Windy.
7. 232	8. 2	233. 0	5. 79	3	383	
1889. 211	6. 1	229. 4	5. 85	2	383	
9. 225	6. 3	228. 9	5. 56	2	383	
9. 227	6. 3	229. 3	5. 76	3	383	
9. 236	6. 8	229. 6	5. 64	3	383	
9. 238	7. 0	228. 6	5. 73	3	383	Windy.
9. 241	6. 9	228. 8	5. 68	3	606	
1890. 186	6. 8	228. 7	5. 72	2	383	Blazing.
0. 251	7. 8	230. 7	5. 61	3	383	
0. 254	7. 8	231. 3	5. 85	3	383	
0. 262	7. 8	230. 5	5. 81	3	383	
0. 268	8. 1	230. 6	5. 86	3	383	
1891. 209	6. 3	229. 6	5. 92	3	383	
1. 232	6. 7	228. 2	5. 80	3	383	
1. 242	6. 9	229. 6	5. 71	3	383	
1. 256	8. 3	229. 6	5. 76	2	383	
1. 259	7. 9	230. 6	5. 83	2	383	Windy.
1. 267	8. 4	229. 8	5. 84	2	606	
1880. 162		234. 12	5. 717			
1881. 313		234. 23	5. 797			
1882. 188		232. 98	5. 762			
1883. 296		234. 13	5. 850			
1885. 298		232. 89	5. 975			
1886. 309		232. 88	5. 885			
1887. 229		232. 57	5. 843			
1889. 230		229. 10	5. 703			
1890. 244		230. 36	5. 770			
1891. 244		229. 57	5. 810			This star has a period of nearly 1,000 years.
Castor. <i>A</i> and <i>C</i> .						
1891. 242	7. 1	163. 9	72. 97	3	383	
1. 256	8. 5	164. 0	72. 78	2	383	Cloudy.
1. 259	8. 1	164. 0	72. 94	2	383	Windy.
1. 267	8. 6	163. 8	72. 95	2	606	
1891. 256		163. 92	72. 910			
	$\Delta \rho =$	0. 00	+ 0. 020			
		163. 92	72. 930			The star <i>C</i> appears to belong to the system <i>A B</i> .

$$\alpha = 7^{\text{h}} 33^{\text{m}}.4 \quad \delta = 5^{\circ} 32' \quad (10 \text{ and } 10.5.)$$

Σ 1126.

$$\alpha = 7^{\text{h}} 33^{\text{m}}.7 \quad \delta = 5^{\circ} 31' \quad (7 \text{ and } 7.)$$

OS 177.

$$\alpha = 7^{\text{h}} 33^{\text{m}}.7 \quad \delta = 37^{\circ} 43' \quad (7 \text{ and } 8.)$$

OS 179.

$$\alpha = 7^{\text{h}} 37^{\text{m}}.2 \quad \delta = 24^{\circ} 41' \quad (5 \text{ and } 10.)$$

1888. 214	6. 7	234. 1	6. 69	3	383	Motion doubtful.
8. 247	7. 5	233. 0	6. 68	2	383	
1888. 230		233. 55	6. 685			

Σ 1136.

$$\alpha = 7^{\text{h}} 41^{\text{m}}.6 \quad \delta = 65^{\circ} 15' \quad (7 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1891. 174	h. 6.2	° 239.2	// 8.67	2	383	Faint.
1. 177	5.7	238.8	8.48	2	383	
1891. 176		239.00	8.575			A slow motion, but probably not binary.

5 Navis.

$$\alpha = 7^{\text{h}} 42^{\text{m}}.3 \quad \delta = -11^{\circ} 54' \quad (5 \text{ and } 7.)$$

1887. 197	7.2	15.0	3.39	2	383	Clouds.
7. 205	7.1	14.6	3.21	2	383	
7. 207	8.5	16.7	3.15	3	383	
1887. 203		15.43	3.250			No motion.

 Σ 1175.

$$\alpha = 7^{\text{h}} 56^{\text{m}}.1 \quad \delta = 4^{\circ} 30' \quad (8 \text{ and } 9.)$$

1885. 235	8.0	223.6	1.99	2	383	
5. 292	9.7	221.8	1.88	2	383	
5. 303	9.9	222.2	1.85	3	383	
5. 322	9.8	222.8	1.81	2	383	
1885. 288		222.60	1.882			Motion.

O Σ 187.

$$\alpha = 7^{\text{h}} 56^{\text{m}}.5 \quad \delta = 43^{\circ} 23' \quad (7 \text{ and } 7.)$$

1891. 190	6.7	280.8	0.36	2	888	Elongated only.
1. 204	6.5	280.8	0.37	3	888	Elongated.
1891. 197		280.80	0.365			A slow motion in angle.

 Σ 1187.

$$\alpha = 8^{\text{h}} 1^{\text{m}}.9 \quad \delta = 32^{\circ} 35' \quad (7 \text{ and } 8.)$$

1888. 255	7.8	50.4	1.97	3	383	
8. 258	7.7	50.7	2.08	3	383	
8. 266	7.8	49.9	2.19	3	383	
1888. 260		50.33	2.080			

ζ **Cancer** = Σ **1196.** *A* and *B*. $\alpha = 8^h 5^m.3$ $\delta = 18^\circ 1'$ (6 and 7.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 169	7.7	87.4	0.60	3	888	
0. 180	6.6	85.1	0.54	3	888	
0. 210	7.9	83.5	0.64	2	606	
0. 249	7.5	83.3	0.66	4	606	
0. 251	7.6	86.7	0.63	3	606	
1881. 290	9.2	80.5	0.69	3	606	
1. 292	8.8	79.9	0.75	2	606	
1. 311	9.4	76.6	0.69	2	606	
1882. 134	6.6	73.2	0.88	2	606	
2. 194	7.9	74.0	0.71	3	606	
2. 227	7.1	72.2	0.83	2	606	
2. 232	7.5	74.0	0.75	2	606	
1883. 284	9.3	66.1	0.92	3	606	
3. 298	9.7	67.5	0.76	2	606	
3. 306	9.4	66.0	0.75	2	606	
3. 336	10.0	65.9	0.87	2	606	
1884. 229	7.8	65.9	0.95	3	606	
4. 249	7.8	66.3	0.86	3	606	
4. 268	8.2	67.3	0.92	3	606	
4. 301	9.0	60.1	0.96	2	383	Blurred images.
4. 320	9.3	62.7	0.72	3	606	
1886. 270	8.9	52.7	1.20	2	383	
6. 273	9.1	53.0	0.97	3	606	
6. 287	8.4	59.0	0.94	3	383	
6. 290	8.6	55.2	1.01	3	606	
1887. 207	8.8	49.2	1.03	3	383	
7. 227	7.2	51.7	0.85	3	606	
7. 257	7.7	49.8	0.85	3	606	
7. 265	8.0	50.8	0.85	3	606	
1888. 206	8.5	41.4	1.19	2	383	
8. 256	8.0	48.7	0.97	2	383	
8. 258	8.0	48.7	0.98	3	383	
8. 266	8.1	47.4	0.97	3	383	
1889. 197	6.7	44.7	1.08	3	606	
9. 227	7.0	41.9	0.94	2	606	
9. 236	7.1	43.1	0.98	3	606	
9. 238	7.2	43.9	0.98	2	606	Cloudy.
9. 241	7.1	44.4	0.95	3	606	
1890. 279	8.7	37.8	0.96	3	606	
0. 282	8.3	36.1	1.01	2	606	
0. 284	9.1	37.4	0.99	2	606	Cloudy.
0. 287	8.4	36.2	1.02	3	606	
1891. 190	7.1	34.0	1.15	2	606	
1. 204	6.8	37.2	1.00	3	606	Windy.

ζ **Canceri** = Σ **1196.** *A* and *B*—Continued.

$$\alpha = 8^{\text{h}} 5^{\text{m}}.3 \quad \delta = 18^{\circ} 1' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	"			
1891. 210	6. 8	36. 1	1. 14	3	606	
1. 231	6. 9	35. 1	1. 00	3	606	
1. 259	7. 4	36. 0	0. 92	2	606	
1880. 212		85. 20	0. 614			
1881. 298		79. 00	0. 710			
1882. 197		73. 35	0. 792			
1883. 306		66. 38	0. 825			
1884. 273		64. 46	0. 882			
1886. 280		54. 98	1. 030			
1887. 239		50. 38	0. 895			
1888. 247		46. 55	1. 028			
1889. 228		43. 60	0. 986			
1890. 283		36. 88	0. 995			
1891. 219		35. 68	1. 042			

ζ Canceri = Σ 1196. $\frac{A}{2} \frac{B}{2}$ and <i>C</i> .						
1880. 169	7. 9	132. 1	5. 46	2	888	
0. 180	6. 8	132. 6	5. 48	2	888	
0. 210	8. 0	129. 5	5. 44	2	606	
0. 249	7. 7	132. 5	5. 50	3	606	
0. 250	7. 8	133. 0	5. 57	3	606	
1881. 290	9. 4	131. 8	5. 47	2	606	Cloudy.
1. 292	9. 0	131. 5	5. 55	2	606	
1. 311	9. 6	129. 8	5. 58	2	606	
1882. 134	6. 8	132. 6	5. 62	2	606	
2. 194	8. 1	130. 1	5. 53	2	606	
2. 227	7. 3	131. 7	5. 65	2	606	
2. 232	7. 7	131. 7	5. 65	2	606	
1883. 284	9. 5	130. 9	5. 56	2	606	
3. 298	9. 8	129. 1	5. 57	2	606	
3. 306	9. 5	130. 8	5. 59	2	606	
3. 336	10. 1	128. 0	5. 65	2	606	
1884. 229	7. 9	125. 2	5. 69	2	606	
4. 268	8. 4	126. 3	5. 77	3	606	
4. 301	9. 2	125. 8	5. 56	2	383	
4. 320	9. 5	127. 0	5. 58	3	606	
1886. 270	8. 7	124. 8	5. 70	2	383	
6. 273	8. 9	127. 8	5. 64	3	606	
6. 287	8. 6	124. 8	5. 67	3	383	
6. 290	8. 8	125. 6	5. 49	3	606	

ζ **Cancer** = Σ **1196.** $\frac{A\ B}{2}$ and C —Continued.

$$a = 8^h\ 5^m.7 \quad \delta = 18^\circ\ 1' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1887. 207	8.9	126.1	5.58	3	383	
7. 227	7.3	127.0	5.60	3	606	
7. 257	7.8	127.3	5.64	3	606	
7. 265	8.1	125.4	5.66	3	606	
1888. 206	8.6	123.9	5.43	2	383	
8. 256	8.1	124.5	5.55	2	383	
8. 258	8.1	123.8	5.51	3	383	
8. 266	8.2	122.3	5.69	2	383	
1889. 197	6.9	123.5	5.64	3	606	
9. 227	7.1	122.6	5.70	2	606	
9. 236	7.2	124.7	5.72	3	606	
9. 241	7.2	122.8	5.76	3	383	
1890. 279	8.9	122.8	5.45	3	606	
0. 282	8.5	123.4	5.44	2	606	
0. 287	8.5	122.8	5.48	3	606	
1891. 190	7.3	121.6	5.50	2	606	
1. 204	6.9	123.2	5.55	2	606	Windy.
1. 210	7.0	123.1	5.44	3	606	
1. 231	7.1	123.3	5.54	2	606	
1. 259	7.6	120.6	5.49	2	606	
1880. 212		131.94	5.490			
1881. 298		131.03	5.533			
1882. 197		131.52	5.612			
1883. 306		129.70	5.592			
1884. 280		126.08	5.650			
1886. 280		125.75	5.625			
1887. 239		126.45	5.620			
1888. 246		123.62	5.545			
1889. 225		123.40	5.705			
1890. 283		123.00	5.457			
1891. 219		122.36	5.504			
Σ 1202.						
$a = 8^h\ 7^m.0 \quad \delta = 11^\circ\ 13' \quad (8 \text{ and } 10.)$						
1885. 301	9.6	322.4	2.33	3	383	
5. 303	10.1	322.3	2.33	2	383	
5. 307	10.3	323.2	2.29	2	383	
5. 311	10.1	321.2	2.29	2	383	
1885. 306		322.28	2.310			A slow motion.

The stars $A\ B\ C$ form a very interesting system. To satisfy the observations it is assumed that the motion of C is disturbed by a dark companion. See Professor SEELIGER'S investigations on the motions of this system.

Σ 1216.

$$a = 8^h 15^m.2 \quad \delta = -1^\circ 13' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1880. 249	8. 0	167. 8	0. 36	3	888	
0. 251	8. 1	164. 8	0. 36	3	888	
1882. 243	8. 1	167. 4	0. 35	2	888	
1891. 210	7. 6	179. 2	0. 55	2	606	
1. 270	7. 9	185. 0	0. 37	3	888	
1. 281	8. 3	182. 2	0. 46	2	888	
1. 283	8. 4	186. 4	0. 47	2	888	
1880. 915		166. 67	0. 357			
1891. 261		183. 20	0. 462			Motion in angle.

 φ^2 Cancri = Σ 1223.

$$a = 8^h 19^m.5 \quad \delta = 27^\circ 20' \quad (6 \text{ and } 7.)$$

1886. 322	10. 0	36. 2	4. 88	2	383	
6. 328	9. 8	36. 8	4. 86	2	383	
6. 339	10. 0	36. 2	4. 94	2	383	
1886. 330		36. 40	4. 893			No motion.

 ν^1 Cancri = Σ 1224.

$$a = 8^h 19^m.6 \quad \delta = 24^\circ 56' \quad (6 \text{ and } 7.)$$

1886. 322	10. 2	43. 4	6. 13	2	383	
6. 328	10. 0	43. 8	5. 86	2	383	
6. 339	10. 2	42. 7	6. 00	2	383	
1886. 330		43. 30	5. 997			No motion.

 Σ 1263.

$$a = 8^h 37^m.3 \quad \delta = 42^\circ 9' \quad (8. \text{ and } 8.)$$

1889. 236	7. 6	19. 55	47. 32	3	383	
9. 241	7. 5	19. 82	47. 26	3	383	
1889. 238	$\Delta\rho =$	19. 68	47. 290			
		0. 00	+ 0. 014			
		19. 68	47. 304			Proper motion.

ϵ **Hydræ** = Σ **1273.** *A* and *B*. $\alpha = 8^h 40^m.4$ $\delta = 6^\circ 51'$ (4 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 249	8. 3	221. 7	3. 48	3	383	
0. 251	8. 3	218. 7	3. 49	3	383	
0. 262	8. 4	221. 3	3. 15	2	383	
0. 268	9. 6	223. 9	3. 33	3	383	
1883. 306	9. 8	226. 1	3. 20	2	383	
3. 339	10. 9	227. 6	3. 46	3	363	
3. 342	9. 7	226. 3	3. 35	3	383	
1884. 229	8. 3	226. 8	3. 59	2	383	
4. 301	9. 5	223. 7	3. 33	2	383	
4. 320	10. 0	226. 4	3. 64	2	383	
4. 325	9. 5	226. 5	3. 43	2	383	
1888. 256	8. 3	227. 7	3. 32	2	383	
8. 258	8. 4	228. 0	3. 22	3	383	
8. 266	8. 4	227. 5	3. 28	2	383	
8. 269	8. 3	226. 6	3. 39	3	383	
1880. 258		221. 40	3. 362			
1883. 329		226. 67	3. 337			
1884. 294		225. 85	3. 498			
1888. 262		227. 45	3. 302			A slow motion in angle.

 ϵ **Hydræ** = Σ **1273.** *A* and *C*. (4 and 14.)

1880. 249	8. 5	193. 5	19. 83	3	383	
1884. 229	8. 4	194. 0	19. 55	2	383	
1888. 258	8. 5	193. 9	19. 93	3	383	15th mag.
1888. 269	8. 5	194. 0	19. 84	3	383	
1885. 251	$\Delta p =$	193. 85	19. 788			
		0. 00	+ 0. 010			
		193. 85	19. 798			

 Σ **1291.** $\alpha = 8^h 46^m.5$ $\delta = 31^\circ 4'$ (6 and 6.)

1886. 328	10. 2	328. 7	1. 34	2	383	
6. 339	10. 5	328. 1	1. 23	2	383	
6. 342	10. 6	326. 6	1. 32	2	383	
1886. 336		327. 80	1. 297			Motion doubtful.

O Σ 196.

$$\alpha = 8^{\text{h}} 50^{\text{m}}.9 \quad \delta = 48^{\circ} 30' \quad (3 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889. 241	h. 7.8	° 359.1	// 8.79	3	383	Motion.
9. 247	7.6	359.3	8.83	3	383	
1889. 244		359.20	8.810			

 Σ 1300.

$$\alpha = 8^{\text{h}} 54^{\text{m}}.7 \quad \delta = 15^{\circ} 44' \quad (9 \text{ and } 10.)$$

1885. 303	10.4	201.6	5.04	2	383	Clouds.
5. 322	10.1	202.0	4.94	3	383	
5. 336	11.2	202.2	4.93	2	383	
1885. 320		201.93	4.970			Perhaps a slow motion.

 Σ 1306.

$$\alpha = 8^{\text{h}} 59^{\text{m}}.8 \quad \delta = 67^{\circ} 37' \quad (5 \text{ and } 9.)$$

1889. 271	8.2	226.1	1.96	2	383	Motion.
9. 274	8.4	221.5	1.94	2	383	
9. 277	8.0	225.5	1.94	3	383	
6889. 274		224.37	1.947			

 Σ 1316. A and B.

$$\alpha = 9^{\text{h}} 1^{\text{m}}.9 \quad \delta = -6^{\circ} 39' \quad (8 \text{ and } 10.)$$

1889. 247	8.3	167.8	8.26	3	606	Motion.
9. 260	9.2	167.0	8.30	2	383	
1889. 254		167.40	8.280			

 Σ 1316. A and C.

1889. 247	8.5	140.9	7.05	3	606	
9. 260	9.3	138.2	7.09	2	383	
1889. 254		139.55	7.070			

OΣ 197.

$$\alpha = 9^{\text{h}} 3^{\text{m}}.3 \quad \delta = 3^{\circ} 25' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 272	h. 8. 1	° 61. 5	" 1. 39	3	383	
8. 286	9. 0	64. 3	1. 45	3	383	
8. 294	9. 3	65. 3	1. 37	3	383	
1888. 284		63. 70	1. 403			

No motion.

Σ 1329.

$$\alpha = 9^{\text{h}} 9^{\text{m}}.6 \quad \delta = -0^{\circ} 42' \quad (8 \text{ and } 8.)$$

1885. 235	9. 0	67. 9	21. 83	2	383	
5. 259	8. 3	68. 1	21. 86	2	383	
1885. 247	$\Delta p =$	68. 00	21. 845			
		0. 00	+ 0. 007			
		68. 00	21. 852			Motion in distance.

Σ 3121.

$$\alpha = 9^{\text{h}} 10^{\text{m}}.7 \quad \delta = 29^{\circ} 7' \quad (7 \text{ and } 8.)$$

1880. 249	8. 8	200. 8	0. 32	2	888	
0. 251	8. 6	202. 5	0. 36	3	888	
0. 281	8. 7	197. 6	0. 38	3	888	
1883. 259	10. 2	213. 7	0. 45	2	888	
3. 339	11. 2	216. 3	0. 38	3	888	
3. 342	10. 2	217. 2	0. 53	3	888	
1891. 210	7. 2	160. 7	0. 34	2	888	
1. 270	8. 1	162. 2	0. 32	3	888	
1. 281	8. 5	165. 0	0. 38	2	888	
1. 283	8. 6	165. 3	0. 35	2	888	
1880. 260		200. 30	0. 353			
1883. 313		215. 73	0. 453			
1891. 261		163. 30	0. 348			

Probably a binary of short period.

38 Lyncis.

$$\alpha = 9^{\text{h}} 11^{\text{m}}.4 \quad \delta = 37^{\circ} 19' \quad (4 \text{ and } 7.)$$

1887. 232	8. 5	237. 0	3. 23	2	383	
7. 254	8. 1	231. 6	3. 12	2	383	
7. 257	8. 0	231. 3	2. 75	3	606	
7. 265	8. 3	238. 8	2. 88	3	606	
7. 270	8. 2	239. 6	2. 83	3	606	
1887. 256		235. 66	2. 962			

A slow motion.

Σ 1331.

$$\alpha = 9^{\text{h}} 11^{\text{m}}.5 \quad \delta = 61^{\circ} 50' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889. 271	h 8. 5	o 156. 4	o. 81	2	606	
9. 277	8. 2	150. 3	0. 95	3	606	
9. 310	9. 5	153. 3	0. 79	3	606	
1889. 286		153. 33	0. 850			

No motion.

 Σ 1338.

$$\alpha = 9^{\text{h}} 13^{\text{m}}.5 \quad \delta = 38^{\circ} 42' \quad (7 \text{ and } 7.)$$

1888. 272	8. 3	157. 8	1. 61	3	383	
8. 286	8. 8	157. 0	1. 58	3	383	
8. 296	9. 0	160. 1	1. 43	3	383	
1888. 285		158. 30	1. 540			

A slow motion.

 $O\Sigma$ 200.

$$\alpha = 9^{\text{h}} 16^{\text{m}}.6 \quad \delta = 52^{\circ} 5' \quad (7 \text{ and } 9.)$$

1889. 277	8. 7	340. 8	1. 57	2	606	
9. 277	8. 6	335. 2	1. 51	3	606	
9. 310	9. 8	334. 9	1. 37	2	606	
1889. 286		336. 97	1. 483			

Motion doubtful.

 $O\Sigma$ 201.

$$\alpha = 9^{\text{h}} 16^{\text{m}}.8 \quad \delta = 28^{\circ} 26' \quad (7 \text{ and } 11.)$$

1888. 272	8. 5	226. 3	1. 37	3	383	
8. 286	9. 2	226. 5	1. 37	3	383	
8. 305	9. 3	227. 4	1. 36	2	383	
1888. 288		226. 73	1. 367			

Perhaps a slow motion.

 Σ 1348.

$$\alpha = 9^{\text{h}} 18^{\text{m}}.0 \quad \delta = 6^{\circ} 49' \quad (7 \text{ and } 8.)$$

1885. 322	10. 3	324. 2	1. 79	3	383	
5. 342	10. 9	324. 0	1. 72	3	383	
5. 344	10. 2	322. 1	1. 74	2	383	
1885. 336		323. 43	2. 750			

A slow motion.

Σ 1355.

$$\alpha = 9^{\text{h}} 21^{\text{m}}.2 \quad \delta = 6^{\circ} 48' \quad (7 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	//			
1887. 254	8. 4	334. 3	2. 62	2	383	
7. 257	8. 2	333. 1	2. 57	3	606	
7. 270	8. 5	332. 8	2. 62	3	606	
1887. 260		333. 40	2. 603			Perhaps a slow motion.

 ω Leonis = Σ 1356.

$$\alpha = 9^{\text{h}} 22^{\text{m}}.0 \quad \delta = 9^{\circ} 35' \quad (6 \text{ and } 7.)$$

1880. 232	8. 5	78. 5	0. 55	3	606	
0. 249	9. 1	78. 1	0. 53	2	606	
0. 251	8. 8	81. 9	0. 43	2	888	
0. 268	9. 9	83. 4	0. 38	3	888	
0. 273	9. 0	83. 4	0. 44	3	888	
0. 281	9. 0	82. 5	0. 44	3	888	
1881. 290	9. 6	82. 8	. .	3	888	Clouds.
1. 292	9. 3	84. 8	0. 48	2	606	
1. 328	9. 8	85. 3	0. 52	2	606	
1. 331	9. 9	84. 3	0. 44	3	888	
1882. 281	9. 0	82. 3	0. 60	2	606	
2. 295	9. 0	83. 6	0. 51	2	606	
2. 298	9. 4	85. 5	0. 44	2	888	
2. 314	9. 6	85. 1	0. 41	2	888	
1883. 339	11. 4	91. 3	0. 58	3	888	
3. 342	10. 5	90. 8	0. 60	2	888	
3. 347	10. 4	90. 6	0. 67	2	606	
1884. 268	8. 6	90. 8	0. 57	3	606	
4. 320	9. 8	95. 5	0. 53	2	606	
4. 333	9. 8	92. 5	0. 54	2	606	
4. 361	10. 6	94. 6	0. 56	2	606	
1887. 270	8. 7	96. 4	0. 54	3	606	
7. 279	8. 8	93. 8	0. 58	2	606	
7. 331	9. 7	97. 5	0. 51	2	606	
7. 339	9. 9	94. 7	0. 51	3	606	
1888. 269	8. 7	96. 9	0. 62	2	606	
8. 272	8. 7	97. 7	0. 70	2	383	
8. 286	9. 4	98. 5	0. 74	2	383	
8. 294	9. 5	98. 6	0. 63	2	383	
8. 316	9. 3	100. 0	0. 63	3	383	
1889. 247	8. 1	96. 7	0. 66	3	606	
9. 263	8. 5	100. 7	0. 67	3	606	
9. 277	9. 5	100. 1	0. 60	2	606	
9. 312	9. 2	99. 3	0. 70	2	606	Windy.
9. 334	10. 7	102. 4	0. 71	3	606	

ω Leonis = Σ 1356—Continued.

$$\alpha = 9^{\text{h}} 22^{\text{m}}.0 \quad \delta = 9^{\circ} 35' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	′			
1890. 301	9. 2	101. 7	0. 60	3	606	Cloudy
0. 306	9. 1	100. 1	0. 66	3	606	
0. 309	9. 3	101. 3	0. 69	2	606	
0. 344	10. 1	101. 9	0. 62	3	606	
1891. 270	8. 4	100. 8	0. 71	3	606	
1. 273	8. 3	100. 7	0. 82	2	606	
1. 281	8. 7	101. 2	0. 71	2	606	
1. 283	8. 8	102. 4	0. 71	2	606	
1. 289	8. 7	100. 7	0. 79	3	606	
1880. 259		81. 30	0. 462			A binary with period of about 100 years.
1881. 310		84. 30	0. 480			
1882. 297		84. 12	0. 490			
1883. 343		90. 90	0. 617			
1884. 320		93. 35	0. 550			
1887. 305		95. 60	0. 535			
1888. 287		98. 34	0. 664			
1889. 287		99. 84	0. 668			
1890. 315		101. 25	0. 642			
1891. 279		101. 16	0. 748			

 $O\Sigma$ 205.

$$\alpha = 9^{\text{h}} 35^{\text{m}}.0 \quad \delta = 41^{\circ} 31' \quad (8 \text{ and } 12.)$$

1889. 247	7. 8	200. 4	11. 99	3	383	No motion.
9. 263	8. 3	200. 3	12. 06	3	383	
1889. 255	$\Delta \rho =$	200. 35	12. 025			
		0. 00	+ 0. 004			
		200. 35	12. 029			

 Σ 1377.

$$\alpha = 9^{\text{h}} 37^{\text{m}}.2 \quad \delta = 3^{\circ} 11' \quad (8 \text{ and } 11.)$$

1887. 270	8. 9	139. 2	3. 73	3	606	Faint; haze.
7. 278	9. 0	139. 1	3. 77	2	383	
7. 330	10. 1	138. 9	3. 87	2	383	
1887. 293		139. 07	3. 790			Motion doubtful.

Σ 1389.

$$\alpha = 9^{\text{h}} 45^{\text{m}}.5 \quad \delta = 27^{\circ} 33' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1886. 273	h. 9. 7	° 312. 9	// 2. 16	4	606	Motion.
6. 287	8. 8	313. 9	2. 14	2	383	
1886. 280		313. 40	2. 150			

 Σ 1386.

$$\alpha = 9^{\text{h}} 45^{\text{m}}.6 \quad \delta = 69^{\circ} 28' \quad (8 \text{ and } 8.)$$

1891. 174	6. 6	294. 1	1. 86	2	383	Motion doubtful.
1. 177	5. 9	296. 0	1. 81	2	383	
1891. 176		295. 05	1. 835			

A. C. 5.

$$\alpha = 9^{\text{h}} 46^{\text{m}}.6 \quad \delta = -7^{\circ} 32.' \quad (6 \text{ and } 7.)$$

1886. 273	9. 3	158. 5	0. 28	3	888	Elongated only.
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 $O\Sigma$ 215.

$$\alpha = 10^{\text{h}} 9^{\text{m}}.8 \quad \delta = 18^{\circ} 20' \quad (6 \text{ and } 7.)$$

1886. 273	9. 9	214. 2	0. 80	3	606	Motion in angle.
6. 287	9. 8	218. 4	0. 81	3	606	
1886. 280		216. 30	0. 805			

39 Leonis.

$$\alpha = 10^{\text{h}} 10^{\text{m}}.7 \quad \delta = 23^{\circ} 42' \quad (6 \text{ and } 11.)$$

1886. 342	11. 0	295. 8	7. 11	2	383	Windy; telescope shaken.
6. 388	12. 0	297. 4	7. 39	2	383	
1886. 365		296. 60	7. 250			Motion doubtful.

$\gamma = \text{Leonis} = \Sigma 1424.$

$$\alpha = 10^{\text{h}} 13^{\text{m}}.3 \quad \delta = 20^{\circ} 27' \quad (3 \text{ and } 4.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1883. 306	h. 10. 3	° 111. 2	" 3. 33	2	383	
3. 339	11. 6	115. 4	3. 57	2	383	
7. 339	10. 1	114. 7	3. 55	3	383	
7. 355	10. 9	114. 5	3. 52	3	383	
7. 360	10. 6	113. 2	3. 48	2	383	
7. 363	10. 8	114. 6	3. 56	2	383	
1884. 794		113. 93	3. 502			A long-period binary.

 $\Sigma 1426.$ A and $B.$

$$\alpha = 10^{\text{h}} 14^{\text{m}}.2 \quad \delta = 7^{\circ} 2' \quad (7 \text{ and } 8.)$$

1884. 268	8. 9	273. 5	0. 71	3	383	
4. 333	10. 1	276. 9	0. 77	3	606	
4. 361	10. 9	283. 6	0. 74	2	606	
4. 363	11. 0	278. 5	0. 75	3	606	
6. 273	10. 1	276. 9	0. 86	3	606	
6. 287	10. 0	276. 7	0. 73	2	606	
1884. 981		277. 68	0. 760			Motion.

 $\Sigma 1426.$ $\frac{A+B}{2}$ and $C.$ (7 and 10.)

1884. 268	9. 1	7. 7	7. 79	3	606	
4. 333	10. 2	10. 1	7. 67	3	606	
4. 361	11. 1	10. 1	7. 81	2	606	
6. 273	10. 3	10. 3	7. 64	3	606	
6. 287	10. 2	9. 5	7. 62	2	606	
1885. 104		9. 54	7. 706			

 $\Sigma 1428.$

$$\alpha = 10^{\text{h}} 18^{\text{m}}.4 \quad \delta = 53^{\circ} 14' \quad (8 \text{ and } 9.)$$

1889. 263	9. 1	84. 9	3. 58	3	606	
9. 271	9. 5	86. 7	3. 47	2	383	
1887. 267		85. 80	3. 525			Motion doubtful.

Σ 1429.

$$\alpha = 10^{\text{h}} 18^{\text{m}}.4 \quad \delta = 25^{\circ} 12' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885. 322	h. 10. 8	° 76. 7	// 0. 98	2	606	A slow motion in angle.
5. 342	11. 2	76. 8	0. 96	2	606	
5. 353	10. 7	78. 3	1. 02	2	606	
1885. 339		77. 27	0. 987			

 Σ 1439.

$$\alpha = 10^{\text{h}} 23^{\text{m}}.7 \quad \delta = 21^{\circ} 24' \quad (8 \text{ and } 9.)$$

1888. 256	9. 6	122. 7	1. 80	2	383	Windy.
8. 258	9. 8	118. 5	1. 80	2	383	
8. 261	9. 5	118. 5	1. 74	2	383	
1888. 258		119. 90	1. 780			A slow motion in angle.

 Σ 1450.

$$\alpha = 10^{\text{h}} 28^{\text{m}}.7 \quad \delta = 9^{\circ} 17' \quad (6 \text{ and } 9.)$$

1886. 273	10. 6	159. 4	2. 41	3	606	Motion doubtful.
6. 287	10. 4	158. 2	2. 38	2	606	
1886. 280		158. 80	2. 395			

O Σ 225.

$$\alpha = 10^{\text{h}} 31^{\text{m}}.9 \quad \delta = 20^{\circ} 1' \quad (8 \text{ and } 10.)$$

1886. 273	11. 0	351. 6	6. 62	3	606	No motion.
6. 287	10. 7	352. 5	6. 57	2	383	
1886. 280		352. 05	6. 595			

 Σ 1457.

$$\alpha = 10^{\text{h}} 32^{\text{m}}.5 \quad \delta = 6^{\circ} 22' \quad (7 \text{ and } 9.)$$

1886. 358	11. 0	311. 5	1. 00	2	606	A very slow motion.
6. 377	11. 5	312. 1	0. 94	2	383	
6. 388	11. 7	315. 4	1. 04	2	383	
1886. 374		313. 00	0. 993			

OΣ 227.

$$\alpha = 10^{\text{h}} 33^{\text{m}}.8 \quad \delta = 11^{\circ} 31' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1887.355	11.1	342.9	0.53	3	606	
7.366	11.4	346.0	0.50	2	383	
7.368	11.4	346.3	0.54	3	606	
1887.363		345.07	0.523			Motion in angle.

35 Sextantis.

$$\alpha = 10^{\text{h}} 37^{\text{m}}.1 \quad \delta = 5^{\circ} 23' \quad (6 \text{ and } 7.)$$

1887.331	10.3	239.4	6.82	2	383	
7.336	10.2	240.0	6.92	2	383	
7.339	10.3	239.6	6.86	3	606	
1887.335		239.67	6.867			No motion.

OΣ 228.

$$\alpha = 10^{\text{h}} 40^{\text{m}}.7 \quad \delta = 23^{\circ} 12' \quad (7 \text{ and } 8.)$$

1887.355	11.9	192.8	0.45	2	606	Clouds.
7.366	11.6	195.8	0.60	2	383	
7.368	11.2	194.1	0.39	3	606	
1887.363		194.23	0.480			Motion doubtful.

OΣ 229.

$$\alpha = 10^{\text{h}} 43^{\text{m}}.1 \quad \delta = 41^{\circ} 44' \quad (6 \text{ and } 7.)$$

1888.316	9.6	329.0	0.89	3	383	
8.318	9.5	329.7	1.00	2	383	
8.321	10.3	327.4	0.87	3	383	Thin clouds.
1888.318		328.70	0.920			Motion in angle.

Σ 1487.

$$\alpha = 10^{\text{h}} 49^{\text{m}}.1 \quad \delta = 25^{\circ} 25' \quad (5 \text{ and } 7.)$$

1885.322	11.2	108.3	6.44	3	383	
5.342	11.8	107.6	6.43	2	383	
5.347	10.8	107.2	6.43	2	383	
6.358	11.3	106.4	6.39	2	383	
6.377	11.9	107.0	6.51	2	383	
6.388	11.4	107.9	6.38	2	383	
1885.856		107.40	6.430			A very slow motion in angle seems probable.

Σ 1500.

$$a = 10^h 53^m.9 \quad \delta = -2^\circ 50' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1886.407	h. 12.5	° 311.8	" 1.22	2	606	Hazy.
6.410	12.3	312.1	1.47	3	383	
1886.408		311.95	1.345			Motion in angle.

 Σ 1504.

$$a = 10^h 59^m.2 \quad \delta = 4^\circ 17' \quad (7 \text{ and } 8.)$$

1888.269	10.1	105.9	1.18	2	383	Motion doubtful.
8.286	9.8	107.0	1.13	3	383	
8.294	9.7	105.3	1.00	2	383	
1888.283		106.07	1.103			

 Σ 1517.

$$a = 11^h 6^m.8 \quad \delta = 20^\circ 48' \quad (7 \text{ and } 7.)$$

1888.305	10.1	278.0	0.55	3	606	Motion.
8.316	10.1	277.9	0.50	2	606	
8.324	10.1	275.1	0.49	3	606	
8.327	9.0	275.2	0.57	3	606	
1888.318		276.55	0.528			

 Σ 1516. A and B .

$$a = 11^h 7^m.6 \quad \delta = 74^\circ 7' \quad (7 \text{ and } 8.)$$

1891.267	9.0	95.7	15.39	2	383	A case of proper motion.
1.270	8.5	97.2	15.34	3	383	
1891.268		96.45	15.365			
	$\Delta\rho =$	+ 0.33	+ 0.006			
		96.78	15.371			

 Σ 1516. A and C . (7 and 13.)

1891.267	9.2	298.6	7.29	2	383	Faint.
1.270	8.7	299.0	7.73	3	383	No motion.
1879.269		298.87	7.583			

ξ Ursæ Majoris = Σ 1523. $\alpha = 11^h 11^m.8$ $\delta = 32^\circ 13'$ (4 and 5.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 251	9. 8	276. 0	1. 81	2	606	
0. 268	10. 2	276. 6	1. 75	2	606	
0. 273	9. 6	277. 5	1. 77	3	606	
0. 281	9. 3	274. 9	1. 84	2	383	
0. 287	9. 6	276. 1	1. 83	3	606	
1881. 282	9. 5	269. 5	1. 90	2	606	
1. 311	10. 7	266. 3	1. 86	2	606	
1. 328	10. 1	267. 8	1. 78	2	383	
1. 331	11. 8	270. 0	1. 82	2	383	
1. 333	10. 1	269. 5	1. 83	3	383	
1. 385	11. 8	270. 5	1. 88	3	383	
1. 396	11. 6	271. 0	1. 82	3	606	
1882. 199	9. 2	264. 6	1. 92	2	383	
2. 227	9. 3	263. 3	1. 98	2	606	Blurred images.
2. 232	9. 1	264. 5	2. 02	2	383	Blurred images.
2. 243	9. 6	263. 9	1. 89	2	383	
2. 281	9. 7	262. 3	2. 12	2	606	
2. 295	9. 3	262. 2	2. 00	2	383	
1883. 342	11. 6	258. 5	2. 15	2	383	
3. 396	11. 8	259. 2	1. 78	2	383	
3. 399	12. 1	258. 4	2. 07	2	383	
3. 405	11. 8	257. 7	1. 89	2	383	
3. 418	11. 8	257. 4	1. 69	3	383	Twilight.
3. 426	12. 6	258. 0	2. 11	2	383	
1884. 268	9. 7	247. 6	1. 86	3	383	
4. 301	9. 9	244. 3	1. 99	2	383	
4. 322	11. 0	250. 8	1. 83	3	383	
4. 328	10. 2	248. 5	1. 85	3	383	
4. 331	10. 9	250. 5	1. 83	3	383	
4. 333	10. 4	250. 3	1. 91	3	606	
4. 366	11. 1	251. 1	1. 97	2	383	
1885. 322	10. 5	243. 6	1. 83	2	383	
5. 344	10. 0	242. 6	1. 79	2	606	
5. 353	10. 3	245. 6	1. 80	3	383	
5. 358	10. 1	246. 5	1. 82	2	383	
5. 361	10. 3	245. 4	1. 74	2	383	
1886. 339	10. 7	236. 6	1. 40	2	383	
6. 342	11. 6	236. 6	1. 88	2	383	
6. 388	12. 3	236. 9	1. 73	2	383	
6. 391	11. 2	237. 5	1. 52	2	383	
6. 399	11. 7	238. 8	1. 57	2	383	
1887. 336	10. 4	231. 1	1. 66	2	383	
7. 338	10. 5	230. 5	1. 64	3	606	
7. 355	10. 7	231. 3	1. 67	3	606	
7. 360	10. 4	229. 6	1. 55	2	606	
7. 363	10. 6	229. 2	1. 55	2	606	
1888. 258	10. 1	222. 7	1. 74	2	383	

ξ Ursæ Majoris = Σ 1523—Continued.

$$a = 11^h 11^m.8 \quad \delta = 32^\circ 13' \quad (4 \text{ and } 5.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.	
	h.	$^{\circ}$	$''$				
1888. 261	9. 9	222. 1	1. 60	2	383	Windy.	
8. 269	9. 8	222. 7	1. 67	3	383		
8. 286	9. 6	221. 9	1. 67	3	383		
8. 294	9. 9	222. 7	1. 53	2	383		
8. 305	9. 8	222. 2	1. 89	3	383		
8. 316	9. 8	221. 9	1. 66	3	383		
1889. 263	8. 7	216. 4	1. 55	3	606		
9. 271	9. 2	216. 3	1. 76	2	383		
9. 277	9. 0	216. 8	1. 75	2	383		
9. 310	10. 6	217. 8	1. 63	2	333		
9. 334	11. 0	215. 3	1. 70	3	383		
1890. 251	9. 7	211. 7	1. 70	2	383		
0. 254	9. 2	210. 7	1. 78	2	383		
0. 268	9. 2	209. 3	1. 54	3	383		
0. 282	9. 8	209. 3	1. 65	3	606		
0. 287	8. 7	209. 9	1. 62	2	606		
0. 306	9. 3	209. 4	1. 55	3	606		
1891. 270	8. 9	200. 4	1. 66	3	606		
1. 284	9. 1	201. 0	1. 57	2	606		
1. 289	9. 0	201. 5	1. 59	3	606		
1. 303	9. 1	201. 1	1. 66	2	606		
1. 322	9. 3	199. 0	1. 52	2	606		
1. 327	9. 4	200. 4	1. 54	3	606		
1880. 272		276. 22	1. 800			This star has a period of 60 years. Its orbit was computed by SAVARY, 1828. See <i>Coun. des Tems</i> , 1830, <i>Additions</i> , p. 56. It is the first determination of the orbit of a double star.	
1881. 339		269. 23	1. 842				
1882. 246		263. 47	1. 988				
1883. 398		258. 20	1. 948				
1884. 321		249. 01	1. 891				
1885. 348		244. 74	1. 796				
1886. 372		237. 28	1. 620				
1887. 350		230. 34	1. 614				
1888. 284		222. 31	1. 680				
1889. 291		216. 52	1. 678				
1890. 275		210. 05	1. 640				
1891. 298		200. 57	1. 590				
Σ 1534.							
$\alpha = 11^{\text{h}} 15^{\text{m}}.5 \quad \delta = 18^{\circ} 51' \quad (8 \text{ and } 11.)$							
1887. 382	11. 8	326. 3	5. 13	3	606	A slow motion in angle.	
7. 385	11. 7	325. 8	5. 19	3	383		
1887. 384		326. 05	5. 160				

This star has a period of 60 years. Its orbit was computed by SAVARY, 1828. See *Coun. des Tems*, 1830, *Additions*, p. 56. It is the first determination of the orbit of a double star.

ϵ Leonis = Σ 1536.

$$\alpha = 11^{\text{h}} 17^{\text{m}}.6 \quad \delta = 11^{\circ} 12' \quad (4 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1886. 342	h. 11. 8	$^{\circ}$ 68. 6	// 2. 67	2	383	Blazing.
6. 377	12. 5	64. 5	2. 64	2	383	Blazing.
6. 388	13. 1	62. 2	2. 77	2	383	Blazing.
1886. 369		65. 10	2. 693			A slow motion.

57 Ursæ Majoris = Σ 1543.

$$\alpha = 11^{\text{h}} 22^{\text{m}}.6 \quad \delta = 40^{\circ} 0' \quad (6 \text{ and } 8.)$$

1886. 388	13. 3	2. 1	5. 39	2	383	
6. 391	11. 5	4. 8	5. 58	2	383	
6. 402	11. 8	5. 3	5. 60	3	383	Misty.
1886. 394		4. 07	5. 523			Very little motion.

O Σ 235.

$$\alpha = 11^{\text{h}} 25^{\text{m}}.4 \quad \delta = 61^{\circ} 45' \quad (6 \text{ and } 8.)$$

1889. 263	9. 4	77. 1	1. 14	2	606	
9. 271	9. 8	78. 5	1. 27	2	383	
9. 277	8. 8	77. 3	1. 07	2	606	
9. 444	13. 2	73. 4	1. 01	3	606	
9. 512	15. 1	78. 2	0. 86	3	606	
1889. 353		76. 90	1. 070			Motion in angle.

 Σ 1549.

$$\alpha = 11^{\text{h}} 26^{\text{m}}.3 \quad \delta = 25^{\circ} 0' \quad (8 \text{ and } 9.)$$

1887. 368	11. 6	114. 6	13. 63	3	606	
7. 374	11. 7	114. 9	13. 66	3	383	Hazy.
1887. 371		114. 75	13. 645			
	$\Delta p =$	0. 00	+ 0. 004			
		114. 75	13. 649			Motion doubtful.

 Σ 1555. A and B.

$$\alpha = 11^{\text{h}} 30^{\text{m}}.0 \quad \delta = 28^{\circ} 27' \quad (6 \text{ and } 6.)$$

1888. 321	10. 8	165. 2	0. 60	3	383	
8. 324	10. 4	168. 2	0. 51	3	606	
8. 327	10. 2	164. 9	0. 56	3	606	
1888. 324		166. 10	0. 557			Motion very small.

$$\Sigma \mathbf{1555.} \quad \frac{A \ B}{2} \text{ and } C. \quad (6 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 321	h. 11.0	° 146.5	// 21.22	3	383	
8. 324	10.5	146.5	21.09	3	606	
1888. 322		146.50	21.155			
	$\Delta p =$	0.00	+ 0.006			
		146.50	21.161			

$O\Sigma \mathbf{237.}$

$$\alpha = 11^{\text{h}} 32^{\text{m}}.5 \quad \delta = 41^{\circ} 49' \quad (8 \text{ and } 9.)$$

1888. 316	10.3	269.0	1.22	2	606	
8. 318	9.8	268.0	1.43	2	383	
8. 321	10.6	270.1	1.08	3	383	
1888. 318		269.03	1.243			A slow motion.

$\mathbf{65 Ursae Majoris} = \Sigma \mathbf{1579.}$

$$\alpha = 11^{\text{h}} 48^{\text{m}}.8 \quad \delta = 47^{\circ} 9' \quad (6 \text{ and } 8.)$$

1887. 336	10.7	39.0	3.87	3	383	
7. 339	10.7	37.8	3.94	2	606	
7. 360	10.8	38.4	3.91	2	606	
1887. 345		38.40	3.907			No motion.

$\Sigma \mathbf{1588.}$

$$\alpha = 11^{\text{h}} 56^{\text{m}}.1 \quad \delta = 73^{\circ} 2' \quad (8 \text{ and } 9.)$$

1889. 444	13.6	54.5	14.64	3	383	Clouds.
9. 477	14.5	54.8	14.75	2	383	
9. 470	14.9	54.0	14.79	2	383	
1889. 470		54.43	14.727			
	$\Delta p =$	+ 0.01	+ 0.006			
		54.44	14.733			A small motion in angle.

Σ 1594. *A* and *B*.

$\alpha = 11^{\text{h}} 57^{\text{m}}.3$ $\delta = 42^{\circ} 3'$ (9 and 10.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	'			
1886. 388	13. 7	159. 3	15. 22	2	383	
6. 407	13. 0	159. 6	15. 17	2	383	
6. 410	12. 7	160. 6	15. 18	3	383	
6. 418	13. 3	159. 9	15. 11	3	383	
1886. 406		159. 85	15. 170			
	$\Delta p =$	0. 00	+ 0. 005			
		159. 85	15. 175			Possibly a small motion.

Σ 5194. *A* and *C*. (9 and 13.)

1886. 388	14. 0	77. 8	25. 07	2	383	
6. 418	13. 5	76. 8	25. 22	3	383	
1886. 403		77. 30	25. 145			
	$\Delta p =$	0. 00	+ 0. 007			
		77. 30	25. 152			

Argelander 116 and 117.

$\alpha = 11^{\text{h}} 57^{\text{m}}.8$ $\delta = 4^{\circ} 0'$ (8 and 9.)

1884. 333	10. 8	87. 51	107. 75	3	383	
4. 363	11. 4	87. 15	107. 84	2	383	
4. 366	11. 6	87. 23	108. 02	2	383	
4. 372	13. 1	87. 31	107. 91	2	383	
4. 374	11. 5	87. 21	107. 87	2	383	
1885. 322	11. 6	87. 52	108. 00	2	383	
5. 336	11. 6	87. 55	108. 14	2	383	
5. 342	12. 1	87. 67	107. 95	3	383	
5. 353	11. 0	87. 60	108. 05	2	383	
5. 355	11. 2	87. 52	108. 01	2	383	Clouds.
1890. 268	10. 8	88. 94	108. 75	3	383	
0. 301	11. 1	88. 98	108. 42	2	383	
0. 306	11. 3	89. 00	108. 54	3	383	
0. 325	11. 6	89. 05	108. 59	3	383	
0. 328	11. 4	89. 08	108. 76	2	383	
1884. 362		87. 28	107. 908			
1885. 342		87. 57	108. 060			
1890. 306		89. 01	108. 642			

These stars are Lalande 22662 and 22667, with large proper motions. The differential refractions are
 $\Delta p = 0^{\circ}.00$ $\Delta s = +0''.030$
which have been applied.

ζ Comæ Ber.

$$\alpha = 11^{\text{h}} 58^{\text{m}}.1 \quad \delta = 22^{\circ} 8' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1887. 336	h. 10.9	° 237.9	// 3.78	2	383	
7. 338	10.9	238.8	3.79	3	606	
7. 360	11.1	237.6	3.88	2	606	
1887. 345		238.10	3.817			

 Σ 1606.

$$\alpha = 12^{\text{h}} 4^{\text{m}}.7 \quad \delta = 40^{\circ} 34' \quad (6 \text{ and } 7.)$$

1885. 361	11.0	338.3	0.99	3	606	
5. 369	11.5	336.4	1.07	3	606	
5. 372	11.2	336.2	1.14	3	383	
5. 374	11.2	336.8	1.25	3	383	
1885. 369		336.92	1.112			A slow motion in angle.

 Σ 1621.

$$\alpha = 12^{\text{h}} 9^{\text{m}}.8 \quad \delta = 6^{\circ} 18' \quad (9 \text{ and } 10.)$$

1887. 360	11.5	132.6	2.59	2	383	Faint.
7. 363	11.8	134.0	2.67	2	383	
7. 366	11.9	136.4	2.39	2	383	
1887. 363		134.33	2.550			A slow motion in angle.

 Σ 1641.

$$\alpha = 12^{\text{h}} 18^{\text{m}}.6 \quad \delta = 38^{\circ} 24' \quad (9 \text{ and } 10.)$$

1888. 316	11.5	36.1	9.16	3	383	
8. 318	10.1	35.7	9.21	2	383	
8. 321	11.3	36.6	9.24	3	383	
1888. 319		36.13	9.203			

 Σ 1644.

$$\alpha = 12^{\text{h}} 20^{\text{m}}.0 \quad \delta = 8^{\circ} 13' \quad (9 \text{ and } 10.)$$

1888. 420	12.8	246.2	20.93	3	383	
8. 428	12.8	246.0	20.82	3	383	
1888. 424	$\Delta\rho =$	246.10	20.875			
		0.00	+ 0.007			
		246.10	20.882			Distance 1'' smaller than Σ .

Lalande 23271.

$$\alpha = 12^{\text{h}} 20^{\text{m}}.5 \quad \delta = 0^{\circ} 30' \quad (8 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885. 374	h. 11. 7	° 225. 0	'' 0. 91	2	606	Faint.
5. 380	11. 8	233. 2	0. 95	2	606	Faint.
5. 399	12. 2	230. 8	0. 79	2	606	
1885. 384		229. 67	0. 883			

Σ 1643.

$$\alpha = 12^{\text{h}} 21^{\text{m}}.2 \quad \delta = 27^{\circ} 42' \quad (8 \text{ and } 9.)$$

1888. 335	10. 6	43. 9	1. 86	3	383	
8. 338	10. 2	44. 8	1. 84	3	383	
8. 340	10. 3	45. 3	1. 81	3	383	Windy.
8. 346	10. 3	44. 3	1. 94	3	383	
1888. 340		44. 58	1. 862			Motion in angle.

Σ 1647.

$$\alpha = 12^{\text{h}} 24^{\text{m}}.5 \quad \delta = 10^{\circ} 23' \quad (7.5 \text{ and } 8.)$$

1885. 361	11. 3	219. 8	1. 21	3	606	
5. 369	11. 7	219. 6	1. 34	3	606	
5. 372	11. 4	220. 1	1. 22	3	383	
1885. 367		219. 83	1. 257			Motion in angle.

Σ 1648.

$$\alpha = 12^{\text{h}} 24^{\text{m}}.5 \quad \delta = 4^{\circ} 13' \quad (8 \text{ and } 10.)$$

1887. 360	11. 9	41. 1	8. 25	2	383	
7. 363	12. 0	41. 7	8. 06	2	383	
7. 366	12. 1	41. 8	8. 25	2	383	
1887. 363		41. 53	8. 187			Motion doubtful.

Σ 1658.

$$\alpha = 12^{\text{h}} 29^{\text{m}}.0 \quad \delta = 8^{\circ} 7' \quad (9 \text{ and } 10.)$$

1885. 322	11. 9	352. 9	2. 47	2	383	
5. 336	11. 9	354. 5	2. 41	2	383	
5. 342	12. 6	354. 0	2. 18	3	383	
5. 353	11. 3	353. 2	2. 37	2	383	
1885. 338		353. 65	2. 358			Motion in angle.

24 Comæ Ber.

$$\alpha = 12^{\text{h}} 29^{\text{m}}.1 \quad \delta = 19^{\circ} 2' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1887. 336	h. 11. 3	° 270. 0	" 20. 37	2	383	
7. 338	11. 3	270. 8	20. 28	3	606	
7. 360	11. 3	270. 3	20. 22	2	383	
1887. 344	$\Delta\rho =$	270. 37	20. 290			
		0. 00	+ 0. 007			
		270. 37	20. 297			No motion.

 Σ 1661.

$$\alpha = 12^{\text{h}} 30^{\text{m}}.0 \quad \delta = 12^{\circ} 4' \quad (8 \text{ and } 8.)$$

1887. 382	12. 8	235. 1	2. 53	3	606	
7. 385	11. 9	236. 0	2. 38	3	383	
7. 387	11. 8	236. 5	2. 38	3	383	
1887. 385		235. 87	2. 430			Motion in angle.

 Σ 1663.

$$\alpha = 12^{\text{h}} 31^{\text{m}}.2 \quad \delta = 21^{\circ} 52' \quad (8 \text{ and } 9.)$$

1887. 368	11. 9	105. 8	0. 63	3	606	
7. 374	11. 9	105. 6	0. 61	3	606	
7. 377	11. 9	102. 6	0. 61	3	383	Faint.
1887. 373		104. 67	0. 617			Probably a slow motion.

 Σ 1668.

$$\alpha = 12^{\text{h}} 33^{\text{m}}.3 \quad \delta = 9^{\circ} 39' \quad (8 \text{ and } 9.)$$

1888. 420	13. 0	197. 1	1. 56	3	383	
8. 428	13. 1	196. 1	1. 60	3	383	
8. 431	13. 0	196. 6	1. 63	3	383	
1888. 426		196. 60	1. 597			No motion.

 Σ 1669.

$$\alpha = 12^{\text{h}} 35^{\text{m}}.0 \quad \delta = -12^{\circ} 21' \quad (6 \text{ and } 7.)$$

1887. 368	12. 2	124. 6	5. 66	2	383	
7. 374	12. 2	123. 4	5. 64	3	606	
7. 377	12. 3	123. 9	5. 58	3	606	
1887. 373		123. 97	5. 627			Motion doubtful.

γ Virginis = Σ 1670. $\alpha = 12^h 36^m.6$ $\delta = -0^\circ 55'$ (3 and 3.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 268	10. 8	158. 3	5. 21	2	383	
0. 273	11. 0	157. 6	5. 38	2	383	
0. 281	10. 7	157. 7	5. 40	2	383	
0. 353	11. 6	158. 4	5. 18	3	383	
0. 358	11. 9	158. 8	5. 16	3	383	
1881. 311	11. 6	156. 7	5. 33	2	383	
1. 322	11. 5	156. 3	5. 34	2	383	
1. 385	13. 1	159. 3	5. 28	2	383	
1. 394	13. 8	158. 5	5. 36	2	383	
1883. 336	12. 4	157. 4	5. 49	2	383	
3. 339	12. 3	156. 9	5. 37	2	383	
3. 342	11. 8	156. 0	5. 46	2	383	
3. 399	12. 3	156. 9	5. 50	2	383	
3. 405	12. 1	156. 6	5. 42	2	383	
1884. 333	12. 1	335. 7	5. 51	2	383	Blazing images.
4. 363	12. 3	336. 7	5. 42	2	383	
4. 374	12. 6	334. 7	5. 37	2	383	Blazing images.
4. 385	11. 4	337. 3	5. 44	2	383	
4. 388	11. 1	336. 0	5. 36	3	383	
1886. 328	11. 4	154. 1	5. 59	2	383	Blazing.
6. 339	12. 2	154. 7	5. 66	2	383	
6. 391	11. 7	154. 8	5. 57	2	383	
6. 402	12. 7	156. 0	5. 46	2	383	
1887. 336	11. 6	155. 5	5. 88	2	383	
7. 338	11. 5	155. 0	5. 40	3	606	
7. 360	12. 2	153. 8	5. 58	2	383	
7. 363	12. 2	154. 8	5. 44	3	383	
1888. 321	12. 2	153. 9	5. 58	2	383	
8. 324	12. 2	155. 5	5. 61	2	383	
8. 327	11. 5	154. 3	5. 42	—	383	
8. 335	11. 3	154. 8	5. 38	2	383	Cloudy.
8. 338	12. 2	154. 3	5. 53	2	383	
1889. 389	11. 7	333. 4	5. 56	2	383	Cloudy.
9. 411	12. 0	333. 2	5. 51	2	383	
9. 433	12. 6	333. 7	5. 50	2	383	
9. 444	12. 8	333. 9	5. 65	3	383	
9. 477	13. 9	330. 9	5. 48	2	383	Cloudy.
1890. 427	12. 6	152. 5	5. 71	3	383	
0. 429	13. 2	153. 5	5. 54	3	383	
0. 440	12. 6	152. 4	5. 52	3	383	
1891. 349	11. 5	333. 4	5. 58	2	383	
1. 355	11. 0	333. 2	5. 68	2	383	
1. 357	10. 8	333. 8	5. 73	2	383	

γ Virginis = Σ 1670—Continued.

$$a = 12^h 36^m.6 \quad \delta = -0^\circ 55' \quad (3 \text{ and } 3.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1891. 442	h. 12. 6	° 332. 8	" 5. 66	3	383	This star has a period of about 200 years. The apparent distance varies from 0''.5 to 6''.3. The orbit has been computed by several astronomers, but is still uncertain.
1. 445	12. 7	332. 4	5. 55	3	383	
1880. 307		158. 16	5. 266			
1881. 353		157. 70	5. 327			
1883. 364		156. 76	5. 448			
1884. 369		156. 08	5. 420			
1886. 365		154. 90	5. 570			
1887. 349		154. 78	5. 575			
1888. 329		154. 56	5. 504			
1889. 431		153. 02	5. 540			
1890. 432		152. 80	5. 590			
1891. 390		153. 12	5. 640			

 Σ 1687. A and B.

$$a = 12^h 46^m.8 \quad \delta = 21^\circ 53' \quad (6 \text{ and } 8.)$$

1885. 353	12. 0	68. 0	1. 32	2	606	A slow motion.
5. 361	11. 6	72. 1	1. 23	2	606	
5. 369	12. 0	70. 7	1. 34	3	606	
1885. 361		70. 27	1. 297			

 Σ 1687. A and C. (6 and 9.)

1885. 353	12. 2	125. 2	28. 75	2	606	
5. 361	11. 8	124. 0	28. 69	2	606	
5. 369	12. 2	125. 2	28. 67	3	606	
1885. 361	$\Delta \rho =$	124. 80	28. 703			
		0. 00	+ 0. 009			
		124. 80	28. 712			

 $O\Sigma$ 256.

$$a = 12^h 50^m.3 \quad \delta = -0^\circ 18' \quad (7 \text{ and } 8.)$$

1887. 368	12. 4	251. 7	0. 56	3	606	Motion in angle.
7. 374	12. 3	251. 4	0. 60	3	606	
7. 377	12. 6	71. 5	0. 52	3	606	
1887. 373		251. 53	0. 560			

Σ 1703.

$$\alpha = 12^{\text{h}} 53^{\text{m}}.1 \quad \delta = 8^{\circ} 33' \quad (8 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1888. 327	11. 9	279. 2	18. 06	2	383	
8. 335	11. 5	279. 7	18. 23	2	383	
8. 338	12. 4	279. 3	18. 03	3	383	
1888. 333	$\Delta\rho =$	279. 40	18. 107			
		0. 00	+ 0. 006			
		279. 40	18. 113			Diminution of the distance.

46 Virginis.

$$\alpha = 12^{\text{h}} 54^{\text{m}}.4 \quad \delta = -2^{\circ} 43' \quad (6 \text{ and } 11.)$$

1885. 374	12. 0	153. 6	1. 32	2	606	
5. 380	11. 4	150. 7	1. 59	2	606	Faint.
5. 399	12. 5	153. 9	1. 27	2	606	
1885. 384		152. 73	1. 393			Motion doubtful.

 Σ 1707.

$$\alpha = 12^{\text{h}} 55^{\text{m}}.3 \quad \delta = 16^{\circ} 31' \quad (8 \text{ and } 10.)$$

1887. 368	12. 7	34. 6	9. 84	3	383	
7. 374	12. 6	34. 6	9. 91	3	606	
7. 379	12. 1	34. 6	9. 71	3	383	Faint; hazy.
1887. 374		34. 60	9. 820			Motion doubtful.

 Σ 1711.

$$\alpha = 12^{\text{h}} 56^{\text{m}}.5 \quad \delta = 14^{\circ} 7' \quad (9 \text{ and } 10.)$$

1887. 382	13. 0	348. 6	1. 11	3	606	
7. 385	12. 1	351. 0	1. 10	3	606	
1887. 384		349. 80	1. 105			Motion doubtful.

 Σ 1712.

$$\alpha = 12^{\text{h}} 58^{\text{m}}.0 \quad \delta = 10^{\circ} 7' \quad (9 \text{ and } 10.)$$

1886. 407	13. 3	153. 0	9. 03	2	383	
6. 410	13. 0	154. 1	9. 01	3	383	Magnitudes nearly equal.
1886. 409		153. 55	9. 020			Motion doubtful.

OΣ 260.

$$\alpha = 13^{\text{h}} 1^{\text{m}}.8 \quad \delta = 27^{\circ} 35' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1887. 374	12. 8	297. 6	0. 56	3	606	Faint; sky hazy.
7. 377	12. 8	126. 1	0. 57	3	606	
7. 379	12. 3	120. 5	0. 57	3	606	
7. 382	13. 2	121. 6	0. 63	3	600	
1887. 378		121. 45	0. 582			Motion doubtful.

Σ 1722.

$$\alpha = 13^{\text{h}} 2^{\text{m}}.5 \quad \delta = 16^{\circ} 8' \quad (8 \text{ and } 9.)$$

1887. 368	12. 9	338. 6	3. 17	3	383	Faint.
7. 374	13. 1	339. 0	3. 19	2	606	
7. 377	13. 0	339. 2	3. 22	3	606	
1887. 373		338. 93	3. 193			Motion doubtful.

42 Comæ Ber. = Σ 1728.

$$\alpha = 13^{\text{h}} 4^{\text{m}}.2 \quad \delta = 18^{\circ} 10' \quad (6 \text{ and } 6.)$$

1880. 353	11. 9	191. 4	0. 48	3	888	Blurred images.
0. 358	12. 1	189. 6	0. 53	3	888	
0. 372	11. 5	193. 6	0. 49	3	808	
0. 383	13. 0	192. 3	0. 59	2	606	
1881. 385	13. 4	193. 9	0. 46	2	888	
1. 394	14. 1	193. 1	0. 50	3	888	
1. 396	11. 8	190. 6	0. 52	2	888	
1. 399	13. 4	192. 8	0. 65	2	888	
1882. 314	11. 8	188. 9	0. 56	2	888	
2. 385	12. 6	193. 3	0. 51	2	606	
2. 402	12. 6	193. 9	0. 53	2	606	
2. 410	12. 8	191. 7	0. 56	2	606	
1883. 399	12. 6	192. 5	0. 50	2	888	
3. 418	12. 1	192. 8	0. 45	3	888	
3. 426	13. 1	192. 7	0. 55	2	606	
3. 453	13. 3	194. 8	0. 52	2	606	
1884. 391	11. 7	190. 7	0. 45	2	606	
4. 407	12. 1	187. 2	0. 33	2	888	
4. 416	12. 1	191. 3	0. 30	3	888	
1885. 492	14. 1	190. 2	0. 35	2	888	
1886. 410	13. 2	185. 4	0. 28	3	888	
6. 426	12. 9	192. 7	0. 27	2	888	
6. 429	12. 4	191. 8	0. 27	2	888	
1887. 426	13. 0	193. 1	0. 42	3	606	

42 Comæ Ber. = Σ 1728—Continued.

$$a = 13^h 4^m.2 \quad \delta = 18^\circ 10' \quad (6 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1887.437	12.6	191.9	0.40	3	606	
7.450	12.8	190.9	0.46	2	606	
7.453	13.3	198.4	0.42	2	606	
1888.346	11.2	194.7	0.48	3	606	
8.420	12.5	192.6	0.46	3	606	
8.433	13.0	194.1	0.42	3	606	
1891.442	12.8	190.4	0.52	3	606	
1.445	12.9	190.0	0.51	3	606	
1.450	13.1	193.9	0.50	2	606	
1880.366		191.72	0.522			
1881.393		192.60	0.532			
1882.378		191.95	0.540			
1883.424		193.20	0.505			
1884.405		189.73	0.360			
1885.492		190.2	0.35			
1886.422		189.97	0.273			
1887.442		193.58	0.425			
1888.400		193.80	0.453			
1891.446		191.43	0.510			A period of 25 years has been computed for this star. It has a large proper motion.

O Σ 261.

$$a = 13^h 6^m.4 \quad \delta = 32^\circ 43' \quad (6 \text{ and } 7.)$$

1887.385	12.8	348.1	1.43	3	606	
7.388	12.0	346.4	1.28	3	383	
7.393	12.0	346.6	1.29	3	606	
1887.389		347.03	1.333			A slow motion.

61 Virginis.

$$a = 13^h 12^m.2 \quad \delta = -17^\circ 38'.2 \quad (5 \text{ and } 10.)$$

1888.335	12.1	27.18	204.67	2	383	
8.338	12.7	27.18	204.57	3	383	
8.346	12.0	27.02	205.18	2	383	
1888.340		27.127	204.807			
	$\Delta p =$	— 0.015	+ 0.159			
		27.112	204.966			Proper motion.

Σ 1734.

$$\alpha = 13^{\text{h}} 14^{\text{m}}.6 \quad \delta = 3^{\circ} 34' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1887. 379	12. 5	190. 5	0. 94	3	606	
7. 382	13. 5	192. 6	1. 11	2	606	
7. 385	12. 6	191. 8	1. 00	2	606	
1877. 382		191. 63	1. 017			A slow motion in angle.

 ζ Ursæ Majoris = Σ 1744.

$$\alpha = 13^{\text{h}} 19^{\text{m}}.1 \quad \delta = 55^{\circ} 33' \quad (3 \text{ and } 4.)$$

1885. 424	12. 5	148. 0	14. 57	2	383	
5. 426	12. 8	147. 8	14. 44	2	383	
5. 429	14. 2	149. 5	14. 55	2	383	
5. 440	13. 0	148. 1	18. 56	2	383	
4. 451	13. 4	148. 9	14. 50	2	383	
1885. 434	$\Delta \rho =$	148. 46	14. 524			A very small relative motion. This star was photographed in 1857 at the Harvard Observatory. See Astronomische Nachrichten, Band 48.
		0. 00	+ 0. 005			
		148. 46	14. 529			

O Σ 266.

$$\alpha = 13^{\text{h}} 22^{\text{m}}.5 \quad \delta = 16^{\circ} 22' \quad (7 \text{ and } 8.)$$

1884. 407	12. 3	338. 8	1. 56	3	383	
4. 410	12. 3	338. 3	1. 57	2	383	
4. 416	12. 4	337. 3	1. 51	3	383	
1884. 411		338. 13	1. 547			Motion.

 Σ 1757.

$$\alpha = 13^{\text{h}} 28^{\text{m}}.2 \quad \delta = 0^{\circ} 18' \quad (8 \text{ and } 9.)$$

1880. 353	12. 2	68. 3	2. 25	3	383	
0. 358	12. 3	67. 4	2. 34	3	383	
0. 377	13. 3	68. 9	2. 26	2	606	
1882. 314	12. 0	68. 9	2. 32	3	606	
2. 380	13. 2	71. 0	2. 19	2	383	
2. 385	12. 8	70. 0	2. 31	2	383	Images blurred.
2. 402	12. 9	69. 8	2. 29	2	606	
2. 410	13. 1	70. 9	2. 34	2	606	
1883. 399	12. 8	70. 7	2. 38	3	606	
3. 405	12. 4	71. 0	2. 31	2	606	

Σ 1757—Continued.

$$\alpha = 13^{\text{h}} 28^{\text{m}}.2 \quad \delta = 0^{\circ} 18' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884. 385	13. 2	73. 8	2. 33	3	383	
4. 388	12. 6	72. 4	2. 21	2	383	
4. 391	11. 9	72. 1	2. 44	2	383	
1886. 407	13. 6	72. 9	2. 18	2	383	
6. 410	13. 5	72. 4	2. 25	3	606	
6. 418	13. 9	72. 4	2. 19	3	383	
1887. 360	12. 5	71. 8	2. 32	2	283	
7. 363	12. 4	71. 5	2. 47	2	383	
7. 366	12. 3	71. 0	2. 38	3	383	
1891. 442	13. 0	73. 4	2. 31	3	606	
1. 445	13. 4	73. 9	2. 41	2	606	
1. 456	14. 2	73. 9	2. 48	2	606	
1880. 363		68. 20	2. 283			
1882. 378		70. 12	2. 290			
1883. 402		70. 85	2. 345			
1884. 388		72. 77	2. 327			
1886. 412		72. 57	2. 207			
1887. 363		71. 43	2. 390			
1891. 448		73. 73	2. 400			A slow motion, but nearly rectilinear.

 P 126.

$$\alpha = 13^{\text{h}} 28^{\text{m}}.3 \quad \delta = -12^{\circ} 36' \quad (6 \text{ and } 6.)$$

1884. 421	12. 6	83. 8	0. 31	2	888	
4. 424	12. 8	81. 8	0. 35	2	888	
4. 426	13. 2	85. 7	0. 36	3	888	
1884. 424		83. 77	0. 340			

25 Canis Venaticorum— Σ 1768.

$$\alpha = 13^{\text{h}} 32^{\text{m}}.1 \quad \delta = 36^{\circ} 54' \quad (6 \text{ and } 7.)$$

1880. 358	12. 8	159. 9	0. 36	2	888	
0. 385	12. 4	155. 2	0. 33	3	888	
1881. 402	13. 3	155. 3	0. 60	2	888	
1. 405	13. 6	159. 2	0. 54	2	606	
1. 407	14. 1	157. 6	0. 46	3	888	
1882. 421	12. 9	155. 5	0. 45	2	606	
2. 431	12. 9	150. 3	0. 43	2	606	
2. 435	12. 8	152. 2	0. 47	2	606	
1883. 418	12. 4	147. 0	0. 59	2	606	

25 Canis Venaticorum = Σ 1768—Continued.

$$\alpha = 13^{\text{h}} 32^{\text{m}}.1 \quad \delta = 36^{\circ} 54' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1884. 416	12. 7	145. 7	0. 61	3	888	Blazing.
4. 418	12. 2	145. 6	0. 66	3	888	
4. 421	12. 3	145. 1	0. 62	3	888	
1886. 429	12. 7	142. 3	0. 76	2	606	
6. 443	12. 7	142. 3	0. 75	2	383	
6. 448	13. 4	150. 9	0. 83	2	606	
6. 468	13. 8	145. 3	0. 80	2	606	
1887. 379	12. 8	147. 0	0. 60	2	606	
7. 385	12. 3	143. 8	0. 64	2	606	
7. 426	13. 2	149. 6	0. 71	2	606	
7. 437	12. 8	142. 9	0. 73	3	606	
1888. 433	13. 3	147. 3	0. 76	3	606	
8. 442	13. 1	143. 9	0. 72	3	606	
8. 458	13. 3	146. 3	0. 71	3	606	
1880. 372		157. 55	0. 345			
1881. 405		157. 37	0. 533			
1882. 429		152. 67	0. 450			
1883. 418		147. 0	0. 59			
1884. 418		145. 47	0. 630			
1886. 447		145. 20	0. 785			
1887. 407		145. 82	0. 670			
1888. 444		145. 83	0. 730			A period of 125 years.

B A C 4549.

$$\alpha = 13^{\text{h}} 33^{\text{m}}.6 \quad \delta = 11^{\circ} 21' \quad (6 \text{ and } 6.)$$

1891. 442	13. 2	190. 4	0. 33	2	888	Elongated.
1. 445	13. 2	189. 3	0. 30	3	888	Elongated.
1. 450	13. 3	193. 6	0. 34	2	888	Elongated.
1891. 446		191. 10	0. 323			The angle differs 50° from the one observed in 1879.

 Σ 1777.

$$\alpha = 13^{\text{h}} 37^{\text{m}}.0 \quad \delta = 4^{\circ} 9' \quad (6 \text{ and } 8.)$$

1884. 385	13. 6	234. 4	3. 50	3	383	Perhaps a slow binary.
4. 388	12. 9	233. 0	3. 54	2	383	
4. 391	12. 4	232. 7	3. 46	3	383	
1885. 353	12. 7	228. 7	3. 44	2	383	
5. 361	12. 5	229. 9	3. 44	3	383	
5. 369	13. 0	227. 7	3. 29	2	383	
1884. 388		233. 37	3. 500			
1885. 361		228. 77	3. 390			

86 Virginis.

$$\alpha = 13^{\text{h}} 39^{\text{m}}.5 \quad \delta = 11^{\circ} 49' \quad (6 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885. 374	h. 12. 6	° 290. 9	' 1. 73	2	383	No motion.
5. 399	12. 8	289. 8	1. 66	2	606	
1885. 386		290. 35	1. 695			

 Σ 1781.

$$\alpha = 13^{\text{h}} 40^{\text{m}}.2 \quad \delta = 5^{\circ} 43' \quad (7 \text{ and } 8.)$$

1884. 385	13. 9	266. 4	0. 89	2	606	
4. 391	12. 6	264. 0	0. 99	3	606	
4. 407	12. 6	260. 4	1. 04	2	383	
1885. 342	12. 9	262. 1	1. 09	2	606	
5. 353	12. 9	261. 7	1. 13	2	383	
5. 361	12. 8	264. 5	0. 96	2	606	
1884. 394		263. 60	0. 973			Motion in angle.
1885. 352		262. 77	1. 060			

 $O\Sigma$ 270.

$$\alpha = 13^{\text{h}} 41^{\text{m}}.6 \quad \delta = 18^{\circ} 4' \quad (5 \text{ and } 12.)$$

1882. 402	13. 4	351. 1	8. 95	2	383	
2. 410	13. 5	351. 9	8. 63	2	383	
2. 435	13. 0	352. 6	8. 87	2	606	
1884. 407	13. 3	353. 8	8. 97	3	383	
4. 416	12. 9	351. 4	8. 92	3	383	
4. 418	12. 5	353. 5	9. 00	3	383	
1882. 416		351. 87	8. 817			Perhaps proper motion.
1884. 414		352. 90	8. 963			

 Σ 1785.

$$\alpha = 13^{\text{h}} 43^{\text{m}}.6 \quad \delta = 27^{\circ} 35' \quad (7 \text{ and } 8.)$$

1880. 353	12. 7	215. 7	1. 91	3	383	
0. 358	12. 4	216. 1	1. 93	3	383	
1881. 396	13. 6	218. 2	1. 87	3	606	
1. 399	13. 8	217. 4	1. 97	3	606	
1882. 402	13. 1	218. 9	1. 96	2	606	
2. 435	13. 2	219. 9	1. 94	2	383	
2. 437	13. 2	220. 9	1. 88	2	606	
1883. 418	12. 7	222. 9	1. 86	3	606	
3. 426	13. 7	220. 4	1. 94	2	606	

Σ 1785—Continued. $\alpha = 13^h 43^m.6$ $\delta = 27^\circ 35'$ (7 and 8.)

Date	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1884. 388	13.4	225.6	1.98	2	383	
4. 391	12.8	224.7	1.79	3	606	
4. 407	13.5	224.1	1.80	3	383	
1885. 361	13.3	227.2	1.83	3	383	
5. 369	13.2	226.7	1.81	2	383	
5. 372	11.8	226.5	1.69	3	383	
1886. 407	13.9	226.1	1.87	2	383	
6. 410	13.7	228.5	1.74	3	606	
6. 418	14.2	229.5	1.87	3	383	
1887. 370	13.1	233.3	1.68	2	383	
7. 375	13.3	232.9	1.63	2	606	
7. 381	13.0	232.0	1.56	3	606	
1888. 335	12.3	232.4	1.53	2	383	Clouds.
8. 346	11.7	232.9	1.62	2	383	
8. 420	13.3	236.4	1.69	3	383	
1889. 389	12.4	235.7	1.41	2	383	
9. 444	13.9	237.4	1.51	3	383	
9. 512	15.8	238.2	1.60	3	606	Clouds.
1890. 427	12.8	239.8	1.61	3	383	
0. 429	13.4	240.7	1.45	3	383	
0. 440	13.0	241.5	1.57	3	383	
1880. 356		215.90	1.920			
1881. 398		217.80	1.920			
1882. 425		219.90	1.927			
1883. 422		221.65	1.900			
1884. 395		224.80	1.857			
1885. 367		226.80	1.777			
1886. 412		228.03	1.827			
1887. 375		232.73	1.623			
1888. 367		233.90	1.613			
1889. 448		237.10	1.507			
1890. 432		240.67	1.543			The motion is nearly rectilinear.
Σ 1788.						
$\alpha = 13^h 48^m.6$ $\delta = 7^\circ 28'$ (6 and 7.)						
1884. 388	13.7	76.0	2.57	2	383	
4. 391	13.1	73.4	2.67	3	606	
4. 407	13.7	74.7	2.76	2	383	
1885. 353	13.2	73.5	2.73	2	383	
5. 361	13.1	74.0	2.69	2	383	
5. 372	12.8	73.7	2.48	3	383	
1884. 395		74.70	2.667			
1885. 362		73.73	2.633			Motion in angle.

OΣ 273.

$a=13^h\ 50^m.3$ $\delta=5^\circ\ 50'$ (7 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1887. 379	h. 13. 2	° 107. 6	' 0. 72	3	606	Motion doubtful.
7. 382	13. 8	109. 4	0. 71	2	606	
1887. 380		108. 50	0. 715			

OΣ 274.

$a=14^h\ 0^m.2$ $\delta=25^\circ\ 59'$ (7 and 10.)

1886. 422	13. 6	67. 3	14. 04	3	383	Motion doubtful.
6. 427	13. 2	67. 2	14. 03	2	383	
1886. 424	$\Delta\rho$	67. 25	14. 035			
		= 0. 00	+ 0. 005			
		67. 25	14. 040			

Σ 1804.

$a=14^h\ 2^m.6$ $\delta=21^\circ\ 46'$ (8 and 9.)

1884. 408	14. 0	19. 9	4. 61	3	383	No motion.
4. 416	13. 3	19. 5	4. 55	3	383	
4. 419	12. 7	20. 3	4. 59	3	383	
1884. 414		19. 90	4. 583			

OΣ 276. A and B .

$a=14^h\ 3^m.1$ $\delta=37^\circ\ 19'$ (8 and 9.)

1887. 386	13. 1	199. 6	0. 50	3	606	Motion doubtful
7. 427	13. 5	201. 2	0. 46	3	606	
1887. 407		200. 40	0. 480			

OΣ 276. $\frac{A\ B}{2}$ and C . (8 and 10.)

1887. 386	13. 2	72. 6	9. 80	3	606	
7. 427	13. 6	73. 0	9. 71	3	606	
1887. 407		72. 80	9. 755			

Σ 1808.

$$a = 14^h 4^m.7 \quad \delta = 27^\circ 10' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1887.457	h. 13.7	° 74.3	' 2.65	3	606	
7.460	13.9	74.6	2.80	3	383	
1887.458		74.45	2.725			Motion doubtful.

 Σ 1812.

$$a = 14^h 6^m.8 \quad \delta = 29^\circ 18' \quad (8 \text{ and } 9.)$$

1887.364	12.8	108.6	14.22	2	383	
7.367	12.6	107.4	14.21	2	383	
1887.366	$\Delta\rho$	108.00	14.215			
		= 0.00	+ 0.005			
		108.00	14.220			No motion.

 Σ 1813.

$$a = 14^h 7^m.4 \quad \delta = 5^\circ 58' \quad (8 \text{ and } 9.)$$

1884.408	14.3	194.6	4.86	2	383	
4.416	13.5	194.6	5.02	3	383	
4.422	13.0	192.8	4.87	3	383	
1884.415		194.00	4.917			Motion doubtful.

 $O\Sigma$ 278.

$$a = 14^h 7^m.5 \quad \delta = 44^\circ 45' \quad (7 \text{ and } 8.)$$

1884.427	13.5	109.9	0.40	3	888	
4.430	12.9	109.3	0.44	2	888	
4.433	13.0	107.7	0.40	2	888	
1886.430	13.0	282.2	0.31	2	888	
6.444	13.3	286.7	0.35	2	888	Clouds.
6.449	13.7	288.1	0.34	2	888	
1884.430		108.97	0.413			
1886.441		105.67	0.343			Motion in angle.

Σ 1820.

$\alpha = 14^{\text{h}} 8^{\text{m}}.8 \quad \delta = 55^{\circ} 53' \quad (8 \text{ and } 9.)$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1882.422	13.3	67.5	2.26	2	606	
2.430	13.4	66.7	2.24	2	606	
1885.424	13.3	69.5	2.29	3	383	
5.427	13.6	69.3	2.26	2	383	
5.441	13.2	70.9	2.20	2	383	
1882.426		67.10	2.250			
1885.431		69.90	2.250			Motion in angle.

 Σ 1819.

$\alpha = 14^{\text{h}} 9^{\text{m}}.3 \quad \delta = 3^{\circ} 42' \quad (8 \text{ and } 8.)$

1880.359	13.3	13.4	1.29	2	606	
0.378	12.9	15.8	1.47	2	606	
0.383	13.3	14.9	1.31	2	383	
0.386	12.7	13.2	1.31	3	606	
1881.386	13.7	15.6	1.22	3	606	
1.394	14.3	16.4	1.28	3	606	
1.397	13.3	14.6	1.28	3	606	
1.402	13.6	16.2	1.25	3	606	
1882.402	13.8	14.5	1.33	2	606	
2.411	13.8	15.3	1.25	2	606	
2.435	13.5	14.8	1.37	2	606	
1883.419	12.9	12.6	1.38	2	606	
3.427	14.0	15.1	1.32	2	606	
1884.416	13.7	14.2	1.35	3	606	
4.422	13.3	13.9	1.35	3	606	
4.424	13.3	13.1	1.28	3	383	
1885.361	13.6	10.9	1.32	2	383	
5.372	13.1	12.4	1.32	2	383	Clouds.
5.375	12.9	12.0	1.32	3	383	
1886.427	13.4	11.5	1.33	2	383	
6.430	13.2	11.7	1.43	2	606	
6.449	14.0	13.2	1.41	2	606	
1887.375	13.5	11.4	1.26	2	606	
7.383	14.0	12.4	1.31	2	606	
7.386	13.4	11.4	1.24	3	606	
7.389	13.1	9.1	1.30	2	383	
1880.376		14.32	1.345			
1881.395		15.70	1.258			
1882.416		14.87	1.317			
1883.423		13.85	1.350			
1884.421		13.73	1.327			
1885.369		11.77	1.320			
1886.435		12.13	1.390			
1887.383		11.08	1.278			Motion nearly rectilinear.

Σ 1825.

$$\alpha = 14^{\text{h}} 11^{\text{m}}.0 \quad \delta = 20^{\circ} 41' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	//			
1884. 416	13. 9	175. 3	4. 20	3	383	
4. 422	13. 5	175. 6	4. 23	3	383	
4. 425	13. 5	174. 6	4. 06	3	383	
1884. 421		175. 17	4. 163			Perhaps a slow motion.

 Σ 1830.

$$\alpha = 14^{\text{h}} 11^{\text{m}}.9 \quad \delta = 57^{\circ} 14' \quad (8 \text{ and } 9.)$$

1885. 424	13. 0	287. 4	6. 02	3	383	
5. 427	13. 2	286. 9	6. 02	2	383	
5. 430	14. 8	287. 0	6. 12	2	383	
1885. 427		287. 10	6. 053			Motion.

 Σ 1831.

$$\alpha = 14^{\text{h}} 12^{\text{m}}.4 \quad \delta = 57^{\circ} 16' \quad (6 \text{ and } 9.)$$

1885. 424	12. 8	140. 2	5. 98	3	383	
5. 427	13. 0	139. 8	6. 00	2	383	
5. 430	14. 6	141. 0	5. 95	2	383	
1885. 427		140. 33	5. 977			No motion.

 $O\Sigma$ 281.

$$\alpha = 14^{\text{h}} 12^{\text{m}}.9 \quad \delta = 9^{\circ} 16' \quad (7 \text{ and } 11.)$$

1886. 407	14. 2	158. 7	1. 54	2	383	
6. 410	13. 9	158. 5	1. 61	2	606	
6. 418	14. 4	157. 3	1. 36	3	383	
1886. 412		158. 17	1. 503			No motion.

 Σ 1834.

$$\alpha = 14^{\text{h}} 15^{\text{m}}.9 \quad \delta = 49^{\circ} 4' \quad (7 \text{ and } 7.)$$

1885. 425	13. 6	121. 1	0. 41	2	888	
5. 575	17. 2	117. 2	0. 44	3	888	
5. 580	16. 4	117. 4	0. 42	3	888	
1885. 527		118. 57	0. 423			Probably motion.

Σ 1837.

$$a = 14^{\text{h}} 18^{\text{m}}.2 \quad \delta = -11^{\circ} 7' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884.417	14.1	303.3	1.43	3	383	
4.422	13.8	303.1	1.50	2	383	
4.428	13.8	303.3	1.42	2	383	
1888.422		303.23	1.450			Motion in angle.

 Σ 1842.

$$a = 14^{\text{h}} 21^{\text{m}}.0 \quad \delta = 4^{\circ} 14' \quad (8 \text{ and } 9.)$$

1887.382	14.2	16.0	2.67	3	383	
7.385	13.6	15.3	2.74	3	606	
1887.384		15.65	2.705			Motion doubtful.

 Σ 1846.

$$a = 14^{\text{h}} 22^{\text{m}}.0 \quad \delta = -1^{\circ} 41' \quad (5 \text{ and } 10.)$$

1887.385	13.8	113.0	4.43	3	383	
7.412	13.3	114.2	4.52	3	383	
7.423	12.9	114.2	4.43	2	383	
1887.407		113.80	4.460			Motion doubtful.

 Σ 1847.

$$a = 14^{\text{h}} 22^{\text{m}}.2 \quad \delta = -9^{\circ} 40' \quad (8 \text{ and } 9.)$$

1888.419	13.9	258.4	23.93	2	383	
8.427	13.6	259.7	24.23	2	383	
1888.423		259.05	24.080			
	$\Delta p =$	0.00	+ 0.007			
		259.05	24.087			Motion nearly rectilinear.

Lalande 26481.

$$a = 14^{\text{h}} 24^{\text{m}}.0 \quad \delta = -15^{\circ} 25' \quad (8 \text{ and } 10.)$$

1883.417	14.0	95.7	2.31	2	383	
3.425	14.3	95.1	2.41	2	383	
1884.416	14.3	94.1	2.37	3	383	
4.422	14.0	95.7	2.43	2	383	
4.427	14.0	96.0	2.29	3	383	
1883.421		95.40	2.360			
1884.422		95.27	2.363			Discovered by J. R. EASTMAN.

Σ 1863. $\alpha = 14^h 34^m.0$ $\delta = 52^\circ 9'$ (7 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1882. 421	13. 6	91. 6	0. 52	2	606	Blurred images.
2. 431	13. 3	92. 1	0. 63	2	606	
1885. 468	13. 8	90. 6	0. 55	2	888	
5. 575	17. 5	94. 3	0. 51	3	888	
5. 580	16. 6	92. 9	0. 59	3	888	
1882. 426		91. 85	0. 575			Motion in angle.
1885. 541		92. 60	0. 550			

 Σ 1864. $\alpha = 14^h 35^m.1$ $\delta = 16^\circ 56'$ (5 and 6.)

1884. 416	14. 6	102. 3	5. 97	3	383	Blazing images.
4. 422	14. 2	102. 9	6. 09	2	383	
4. 427	14. 2	103. 5	5. 94	3	383	
1884. 422		102. 90	6. 000			Perhaps a slow motion in angle.

 Σ 1865. $\alpha = 14^h 35^m.4$ $\delta = 14^\circ 15'$ (4 and 5.)

1884. 427	14. 4	115. 7	0. 59	3	888	Motion in angle.
4. 430	13. 2	114. 8	0. 54	2	888	
4. 433	14. 2	113. 9	0. 66	3	606	
1884. 430		114. 80	0. 597			

 Σ 1867. $\alpha = 14^h 35^m.6$ $\delta = 31^\circ 49'$ (7 and 8.)

1882. 434	13. 7	13. 2	1. 23	2	606	Motion doubtful.
2. 437	13. 5	18. 9	1. 15	2	606	
1884. 430	13. 4	17. 7	1. 24	3	606	
4. 438	13. 8	18. 0	1. 35	3	606	
4. 441	13. 6	17. 4	1. 21	3	606	
1885. 375	13. 4	17. 1	1. 23	3	383	
5. 380	13. 2	15. 6	1. 15	2	383	
5. 399	13. 0	15. 7	1. 19	3	606	
1882. 436		16. 05	1. 190			
1884. 436		17. 70	1. 267			
1885. 385		16. 13	1. 190			

Σ 1871.

$$\alpha = 14^h 37^m.8 \quad \delta = 51^\circ 55' \quad (7 \text{ and } 7.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1891. 322	h. 10.9	° 292.5	// 1.82	2	606	A slow motion in angle.
1. 327	10.2	292.5	1.71	2	606	
1. 344	11.0	293.2	1.73	2	606	
1891. 331		292.73	1.753			

 ϵ Bootis = Σ 1877.

$$\alpha = 14^h 39^m.7 \quad \delta = 27^\circ 35' \quad (3 \text{ and } 6.)$$

1884. 430	13.6	326.1	2.83	2	606	Clouds.
4. 433	13.3	326.4	3.03	2	383	
4. 436	13.8	326.6	2.76	3	383	
1886. 410	14.2	327.0	2.80	2	383	
6. 418	14.8	325.0	3.06	2	383	
6. 421	14.0	325.0	2.85	2	383	
6. 484	13.9	326.5	2.80	2	383	Clouds.
6. 486	15.3	327.1	3.18	2	383	Blazing.
6. 492	15.6	328.5	2.90	2	383	
6. 511	15.3	326.4	2.74	2	383	
1888. 433	13.5	325.7	2.91	3	383	
8. 441	13.3	326.1	2.80	2	383	
8. 449	14.1	326.1	2.90	2	383	
8. 452	13.8	326.8	2.83	2	388	
1884. 433		326.37	2.873			Motion very slow.
1886. 460		326.50	2.904			
1888. 444		326.18	2.860			

 Σ 1876.

$$\alpha = 14^h 40^m.0 \quad \delta = -6^\circ 53' \quad (8 \text{ and } 9.)$$

1887. 384	14.1	73.0	1.13	2	606	Motion in angle.
7. 412	13.6	72.9	1.13	2	383	
1887. 398		72.95	1.130			

 Σ 1879.

$$\alpha = 14^h 40^m.4 \quad \delta = 10^\circ 10' \quad (8 \text{ and } 9.)$$

1887. 425	13.8	168.6	0.37	3	606	Diminution of distance.
7. 436	13.1	175.1	0.38	3	606	
7. 453	13.5	175.6	0.39	2	606	
1887. 438		173.10	0.380			

Σ 1883.

$$\alpha = 14^{\text{h}} 42^{\text{m}}.8 \quad \delta = 6^{\circ} 25' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884.422	14.7	255.1	0.79	2	606	
4.427	14.7	254.5	0.60	3	606	
4.430	13.9	256.6	0.76	2	606	
1886.426	13.7	252.1	0.62	2	606	
6.429	13.4	251.2	0.71	2	606	
6.448	14.2	251.4	0.63	2	606	
1884.426		255.40	0.717			
1886.434		251.57	0.653			Motion in angle.

 ξ Bootis = Σ 1888.

$$\alpha = 14^{\text{h}} 45^{\text{m}}.8 \quad \delta = 19^{\circ} 36' \quad (5 \text{ and } 7.)$$

1881.397	13.9	268.8	4.05	3	383	
1.399	14.0	268.6	4.04	3	383	
1.402	13.8	270.3	4.02	3	383	
1882.410	14.5	271.7	3.94	2	383	
2.431	13.9	268.6	3.99	2	606	
2.434	14.0	270.9	4.05	2	606	
1883.417	13.3	267.2	3.88	2	606	
3.425	14.6	267.4	4.01	2	383	
3.444	14.3	266.6	3.82	2	383	
1884.430	14.2	266.5	3.82	2	606	Clouds.
4.433	13.5	265.0	3.74	2	383	
4.436	14.4	266.1	3.77	3	383	
1885.361	13.8	261.4	3.68	2	383	
5.372	13.4	261.3	3.75	2	383	Blazing.
5.375	13.2	261.6	3.61	3	383	
1886.426	13.9	259.2	3.62	2	383	
6.429	13.7	259.7	3.57	2	383	
6.448	14.4	258.9	3.57	2	606	
1887.423	13.3	255.4	3.64	2	383	
7.425	14.0	256.2	3.52	3	606	
7.436	13.4	256.4	3.46	3	606	
1888.419	14.2	251.3	3.39	2	383	
8.427	13.8	253.0	3.31	2	383	
8.430	13.8	251.3	3.50	2	383	
1889.444	14.2	248.1	3.38	3	383	
9.477	14.9	249.2	3.47	2	383	
9.512	15.5	250.1	3.34	3	606	
1890.427	13.0	245.9	3.17	3	383	
0.429	13.6	246.9	3.27	3	383	
0.440	13.2	246.0	3.19	2	383	

ξ Bootis = Σ 1888—Continued.

$$\alpha = 14^{\text{h}} 45^{\text{m}}.8 \quad \delta = 19^{\circ} 36' \quad (5 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1891. 442	13. 4	242. 8	3. 17	2	606	Windy.
1. 445	13. 6	241. 7	3. 19	2	606	
1. 450	13. 8	242. 8	3. 17	2	606	
1881. 399		269. 23	4. 037			The observations indicate a period of about 130 years.
1882. 425		270. 40	3. 993			
1883. 429		267. 07	3. 903			
1884. 433		265. 87	3. 777			
1885. 369		261. 43	3. 680			
1886. 434		259. 27	3. 587			
1887. 428		256. 00	3. 540			
1888. 425		251. 87	3. 400			
1889. 478		249. 13	3. 397			
1890. 432		246. 27	3. 210			
1891. 446		242. 43	3. 177			

 $O\Sigma$ 287.

$$\alpha = 14^{\text{h}} 47^{\text{m}}.1 \quad \delta = 45^{\circ} 26' \quad (8 \text{ and } 9.)$$

1887. 456	13. 9	316. 4	0. 72	2	606	Motion in angle.
7. 458	14. 2	315. 8	0. 70	3	606	
1887. 457		316. 10	0. 710			

 $O\Sigma$ 288.

$$\alpha = 14^{\text{h}} 47^{\text{m}}.8 \quad \delta = 16^{\circ} 11' \quad (6 \text{ and } 7.)$$

1884. 430	14. 8	195. 3	1. 51	3	383	Motion doubtful.
4. 433	13. 7	195. 3	1. 37	2	383	
4. 436	14. 5	194. 4	1. 40	3	383	
1884. 433		195. 00	1. 427			

 $O\Sigma$ 289.

$$\alpha = 14^{\text{h}} 49^{\text{m}}.8 \quad \delta = 33^{\circ} 0' \quad (6 \text{ and } 10.)$$

1886. 410	14. 4	112. 6	4. 66	3	383	Motion doubtful.
6. 418	14. 6	117. 0	4. 69	3	383	
6. 421	14. 3	115. 3	4. 46	3	383	
1886. 416		114. 97	4. 603			

P 212.

$$\alpha = 14^{\text{h}} 50^{\text{m}}.5 \quad \delta = -20^{\circ} 52' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884. 433	14. 0	291. 6	15. 80	2	383	
4. 438	14. 3	290. 6	15. 98	2	383	
4. 441	13. 8	291. 5	15. 90	3	383	
1884. 437		291. 23	15. 893			
	$\Delta p =$	+ 0. 02	+ 0. 008			
		291. 25	15. 901			Distance increases ; proper motion.

2 Serpentis.

$$\alpha = 14^{\text{h}} 55^{\text{m}}.7 \quad \delta = 0^{\circ} 20' \quad (6 \text{ and } 8.)$$

1887. 565	16. 2	121. 6	0. 46	3	606	
7. 573	15. 9	120. 9	0. 44	2	606	
7. 576	16. 1	119. 7	0. 41	2	606	
1887. 571		120. 73	0. 437			Discovered by S. W. BURNHAM.

44 Bootis = Σ 1909.

$$\alpha = 14^{\text{h}} 59^{\text{m}}.9 \quad \delta = 48^{\circ} 7' \quad (5 \text{ and } 6.)$$

1881. 397	14. 2	241. 7	4. 91	3	383	
1. 399	14. 2	241. 4	4. 96	2	383	
1882. 401	14. 3	241. 9	5. 07	2	383	
2. 410	14. 1	241. 1	4. 88	2	606	
2. 421	13. 8	240. 6	5. 05	2	606	
2. 431	14. 1	240. 5	5. 16	2	606	
1883. 417	13. 7	242. 1	4. 96	2	383	
3. 453	13. 9	241. 9	4. 99	2	383	
3. 554	15. 6	241. 0	4. 77	3	606	
1884. 438	14. 1	240. 8	4. 97	3	383	
4. 441	14. 0	243. 1	4. 91	3	383	
4. 460	13. 7	240. 9	4. 88	2	383	
1885. 375	13. 6	241. 7	4. 98	2	383	
5. 380	13. 7	241. 2	5. 12	2	383	
5. 399	13. 3	240. 7	4. 98	2	606	
1886. 426	14. 2	242. 5	4. 90	2	383	
6. 429	13. 9	242. 1	5. 08	2	383	
6. 448	14. 7	241. 1	4. 88	2	606	
1888. 419	14. 5	241. 2	4. 88	2	383	
8. 427	14. 1	241. 2	4. 95	2	383	
8. 430	13. 6	240. 4	4. 88	2	383	
1889. 512	16. 2	241. 3	4. 94	2	606	
9. 515	14. 8	243. 1	4. 70	2	383	
9. 520	15. 0	243. 2	4. 73	2	383	

44 Bootis = Σ 1909—Continued.

$$a = 14^h 59^m.9 \quad \delta = 48^\circ 7' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1890. 470	13. 7	242. 0	4. 80	2	383	
0. 479	14. 7	240. 5	4. 93	2	383	
0. 481	14. 6	242. 2	4. 78	2	606	
1891. 442	13. 8	241. 3	4. 86	2	606	
1. 445	13. 1	241. 7	4. 85	2	606	
1. 456	13. 4	241. 6	4. 88	2	606	
1881. 398		241. 55	4. 935			
1882. 416		241. 02	5. 040			
1883. 475		241. 67	4. 907			
1884. 445		241. 60	4. 920			
1885. 385		241. 20	5. 027			
1886. 434		241. 90	4. 953			
1888. 425		240. 93	4. 903			
1889. 516		242. 53	4. 790			
1890. 477		241. 57	4. 837			
1891. 448		241. 53	4. 863			A very slow motion.

 Σ 1908.

$$a = 15^h 0^m.1 \quad \delta = 34^\circ 56' \quad (8 \text{ and } 9.)$$

1887. 456	14. 2	143. 0	1. 59	2	606	
7. 477	14. 4	144. 4	1. 42	2	383	
7. 488	14. 7	146. 7	1. 42	3	383	
1887. 474		144. 70	1. 477			A slow motion in angle.

 Σ 1910.

$$a = 15^h 1^m.8 \quad \delta = 9^\circ 41' \quad (7 \text{ and } 7.)$$

1884. 422	14. 9	211. 9	4. 39	2	383	
4. 427	14. 9	212. 1	4. 26	3	383	
4. 430	15. 0	212. 3	4. 22	3	383	
1884. 426		212. 10	4. 290			Motion doubtful.

Lalande 27579.

$$a = 15^h 2^m.9 \quad \delta = 2^\circ 9' \quad (8 \text{ and } 12.)$$

1884. 422	15. 1	40. 9	3. 71	3	383	
4. 427	15. 3	40. 7	3. 78	3	383	
4. 433	14. 2	41. 0	3. 99	2	383	
1884. 427		40. 87	3. 827			

B. A. C. 5020.

$$a = 15^{\text{h}} 8^{\text{m}}.5 \quad \delta = -27^{\circ} 9' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1886.484	14.3	156.3	1.24	2	606	Blurred.
6.492	14.9	157.9	1.19	2	606	Blurred.
6.511	15.1	158.9	1.41	2	383	Blurred.
1886.496		157.70	1.280			

Ö. Arg. S. 14417.

$$a = 15^{\text{h}} 10^{\text{m}}.3 \quad \delta = -15^{\circ} 9' \quad (9.5 \text{ and } 12.)$$

1884.460	15.1	303.1	10.80	2	383	Faint; images blurred. A companion 13th mag.; $p = 240^{\circ}$: $s = 25''$.
4.463	14.5	302.3	11.17	2	383	
4.466	15.4	303.0	10.89	3	383	
1884.463		302.90	10.910			

OΣ 295.

$$a = 15^{\text{h}} 10^{\text{m}}.4 \quad \delta = 37^{\circ} 16' \quad (8 \text{ and } 9.)$$

1884.460	14.0	127.0	0.89	2	606	Cloudy.
4.463	13.9	129.3	1.05	2	606	
4.466	14.1	126.7	0.98	3	606	
1886.484	14.7	124.3	0.76	2	606	
6.492	16.2	128.1	0.90	2	606	
6.514	16.1	127.8	0.80	2	606	
1884.463		127.67	0.973			Motion doubtful.
1886.497		126.73	0.820			

Σ 1926.

$$a = 15^{\text{h}} 10^{\text{m}}.4 \quad \delta = 38^{\circ} 45' \quad (6 \text{ and } 8.)$$

1884.460	14.4	256.0	1.24	2	606	Motion doubtful.
4.463	13.7	255.8	1.42	2	606	
4.466	13.8	257.4	1.32	3	606	
1884.463		256.40	1.327			

Σ 1925.

$$a = 15^{\text{h}} 10^{\text{m}}.5 \quad \delta = -7^{\circ} 50' \quad (7 \text{ and } 8.)$$

1884.433	14.7	11.4	5.05	3	383	Motion doubtful.
4.438	14.5	10.7	5.08	3	383	
4.460	14.7	11.6	5.07	2	383	
1884.444		11.23	5.067			

Σ 1930.

$$\alpha = 15^{\text{h}} 13^{\text{m}}.0 \quad \delta = 2^{\circ} 14' \quad (5 \text{ and } 10.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	//			
1884. 433	15. 0	40. 5	10. 86	3	383	Hazy.
4. 438	14. 7	39. 9	10. 82	2	383	
4. 460	15. 3	39. 9	10. 80	2	383	
1886. 418	15. 1	39. 6	10. 91	2	383	
6. 426	14. 4	39. 9	10. 89	2	383	
1884. 444		40. 10	10. 827			No motion.
1886. 422		39. 75	10. 900			

 Σ 1932.

$$\alpha = 15^{\text{h}} 13^{\text{m}}.2 \quad \delta = 27^{\circ} 18' \quad (6 \text{ and } 7.)$$

1884. 436	14. 8	126. 5	1. 01	3	606	
4. 463	14. 2	129. 1	1. 05	2	383	
4. 466	14. 3	130. 7	1. 03	3	383	
1886. 426	14. 7	128. 4	0. 90	2	606	
6. 429	14. 1	131. 6	0. 90	2	606	
6. 448	15. 2	131. 2	0. 94	2	383	
1884. 455		128. 77	1. 030			Motion in angle and distance.
1886. 434		130. 40	0. 913			

 Σ 1934.

$$\alpha = 15^{\text{h}} 13^{\text{m}}.2 \quad \delta = 44^{\circ} 14' \quad (8 \text{ and } 9.)$$

1882. 421	14. 2	33. 2	6. 62	2	606	
2. 429	13. 8	32. 9	6. 68	2	606	
1884. 466	14. 6	33. 2	6. 73	3	383	
4. 471	14. 2	33. 0	6. 64	3	383	
4. 477	14. 2	31. 7	6. 53	3	383	
1882. 425		33. 05	6. 650			Motion in angle.
1884. 471		32. 63	6. 633			

 η Coronæ Borealis = Σ 1937.

$$\alpha = 15^{\text{h}} 18^{\text{m}}.3 \quad \delta = 30^{\circ} 43' \quad (5 \text{ and } 6.)$$

1881. 397	14. 4	125. 6	0. 43	3	888	
1. 399	14. 4	126. 8	0. 42	2	888	
1. 402	14. 4	124. 5	0. 46	3	888	
1. 405	13. 9	122. 8	0. 55	2	606	

η **Coronæ Borealis** = Σ **1937**—Continued. $\alpha = 15^h 18^m.3$ $\delta = 30^\circ 43'$ (5 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks
	h.	$^\circ$	"			
1882. 431	14. 4	142. 4	0. 54	2	606	
2. 434	14. 3	135. 4	0. 55	2	606	
2. 437	13. 8	135. 4	0. 51	2	606	
2. 494	14. 9	140. 6	0. 45	2	606	
1883. 417	14. 3	149. 0	0. 64	2	606	
3. 453	14. 1	149. 7	0. 58	2	606	
3. 505	15. 0	154. 5	0. 53	2	606	Blazing.
3. 554	15. 8	153. 2	0. 57	2	606	
3. 570	15. 8	155. 8	0. 55	3	606	
3. 581	16. 1	155. 5	0. 51	2	606	Blazing.
1884. 471	14. 4	158. 9	0. 58	3	606	
4. 477	14. 4	160. 2	0. 55	3	606	
4. 479	14. 2	161. 2	0. 57	3	606	
1885. 375	13. 9	167. 7	0. 68	2	606	
5. 399	13. 6	170. 4	0. 74	2	606	Clouds.
5. 424	13. 9	171. 7	0. 55	2	888	
5. 451	14. 2	170. 6	0. 62	3	606	Windy.
1886. 426	14. 9	176. 0	0. 72	2	606	
6. 429	14. 3	178. 8	0. 71	2	606	
6. 448	14. 9	176. 3	0. 75	2	606	
6. 486	15. 0	175. 5	0. 63	2	606	Hazy.
6. 492	14. 7	178. 4	0. 69	3	606	
1887. 425	14. 2	187. 9	0. 64	3	606	
7. 436	13. 9	183. 8	0. 69	3	606	
7. 453	13. 7	187. 4	0. 60	3	606	
7. 458	14. 4	187. 8	0. 58	3	606	
1888. 433	13. 8	198. 8	0. 65	2	606	
8. 441	13. 6	194. 4	0. 64	3	606	
8. 449	14. 4	194. 3	0. 54	3	606	
8. 452	14. 0	194. 6	0. 55	2	606	
8. 458	13. 6	196. 3	0. 71	3	606	
1889. 444	14. 5	202. 7	0. 67	2	606	
9. 512	16. 5	203. 0	0. 61	2	606	
9. 515	15. 1	201. 3	0. 62	2	606	
9. 523	15. 1	202. 1	0. 62	2	606	
1890. 470	14. 2	210. 3	0. 65	2	606	
0. 481	14. 8	208. 1	0. 67	2	606	
0. 498	14. 3	210. 4	0. 60	3	606	
0. 517	14. 9	208. 2	0. 66	2	606	
0. 522	14. 9	211. 5	0. 64	2	606	
0. 525	14. 9	212. 0	0. 60	2	606	
1891. 456	14. 4	219. 0	0. 58	3	606	
1. 470	14. 3	217. 7	0. 61	2	606	Thin clouds.
1. 478	13. 9	216. 1	0. 57	2	606	

η **Coronæ Borealis** = Σ **1937**—Continued.

$$\alpha = 15^{\text{h}} 18^{\text{m}}.3 \quad \delta = 30^{\circ} 43' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1881. 481	14. 0	218. 1	0. 64	3	606	
1. 483	14. 0	221. 0	0. 58	2	606	
1. 489	14. 1	218. 4	0. 67	2	606	
1881. 401		124. 92	0. 465			
1882. 449		138. 45	0. 512			
1883. 507		152. 54	0. 572			
1884. 476		160. 10	0. 567			
1885. 412		170. 10	0. 648			
1886. 456		177. 00	0. 700			
1887. 443		186. 72	0. 628			
1888. 447		195. 68	0. 618			
1889. 498		202. 28	0. 630			
1890. 502		210. 08	0. 637			
1891. 476		218. 38	0. 608			A period of 40 years.

 μ^2 **Bootis** = Σ **1938**.

$$\alpha = 15^{\text{h}} 20^{\text{m}}.0 \quad \delta = 37^{\circ} 46' \quad (7 \text{ and } 8.)$$

1880. 397	14. 6	129. 6	0. 64	3	888	
1881. 402	14. 1	122. 4	0. 63	3	606	
1. 405	14. 2	121. 3	0. 59	2	606	
1. 408	14. 3	122. 1	0. 65	3	888	
1882. 421	14. 7	120. 8	0. 56	2	606	
2. 431	13. 6	122. 7	0. 71	2	606	
2. 434	14. 6	121. 5	0. 65	2	606	
1883. 453	14. 4	116. 9	0. 73	2	606	
3. 554	16. 9	113. 1	0. 68	2	606	
1884. 471	14. 6	114. 4	0. 68	3	606	
4. 477	14. 6	114. 4	0. 63	3	606	
4. 479	14. 4	112. 5	0. 75	3	606	
1885. 451	14. 5	113. 4	0. 75	2	606	Clouds.
5. 495	14. 3	112. 7	0. 74	2	606	
5. 498	14. 2	110. 7	0. 70	2	606	Clouds.
5. 503	14. 3	108. 4	0. 67	2	606	
1886. 492	16. 4	109. 5	0. 64	2	686	
6. 514	17. 1	106. 9	0. 65	2	606	
6. 516	14. 9	105. 6	0. 67	2	606	
1887. 425	14. 4	107. 2	0. 81	3	606	
7. 436	14. 1	106. 2	0. 70	3	606	
7. 453	13. 9	103. 4	0. 58	3	606	
7. 458	14. 6	105. 0	0. 70	3	606	
1888. 433	14. 0	99. 8	0. 57	2	606	

μ^2 Bootis = Σ 1938—Continued. $a = 15^h 20^m.0$ $\delta = 37^\circ 46'$ (7 and 8.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1888.441	h. 13.8	102.1	0.66	3	606	A slow motion.
8.452	14.2	99.9	0.60	2	606	
8.458	13.8	98.3	0.59	3	606	
1880.397		129.6	0.64			
1881.505		121.93	0.623			
1882.429		121.67	0.640			
1883.504		115.00	0.705			
1884.476		113.77	0.687			
1885.487		111.30	0.715			
1886.507		107.33	0.653			
1887.443		105.45	0.698			
1888.446		100.02	0.605			

 μ Bootis. $a = 15^h 20^m.0$ $\delta = 37^\circ 46'$ (4 and 7.)

1881.451	13.2	171.35	108.29	2	383	This star is fixed with respect to μ^2 , but all the stars have a common proper motion.
1.457	14.4	171.48	108.28	2	383	
1881.454		117.42	108.285			
	$\Delta \rho =$	0.00	+ 0.031			
		172.42	108.316			

 Σ 1944. $a = 15^h 21^m.8$ $\delta = 6^\circ 31'$ (7 and 8.)

1884.433	15.2	328.2	1.34	3	606	Motion in angle.
4.438	14.9	329.9	1.37	2	606	
4.460	15.6	329.8	1.30	2	383	
1884.444		329.30	1.337			

 Σ 1945. A and B. $a = 15^h 22^m.3$ $\delta = 15^\circ 7'$ (8 and 9.)

1887.456	14.5	287.82	31.87	2	383	Change of angle.
7.458	14.9	287.70	32.07	3	383	
1887.457		287.76	31.970			
	$\Delta \rho =$	0.00	+ 0.010			
		287.76	31.980			

Σ 1945. *B* and *C*. (9 and 9.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887.456	h. 14.7	° 280.7	// 9.02	2	383	
7.458	15.1	280.6	9.15	3	383	
1887.457		280.65	9.085			

 Σ 1945. *A* and *D*.

1887.456	14.9	27.9	22.99	2	383	Magnitude of D = 14.
7.458	15.3	27.1	23.22	2	383	Magnitude of D = 15.
1887.457	$\Delta p =$	27.50	23.105			
		0.00	+ 0.007			
		27.50	23.122			

 $O\Sigma$ 296. $\alpha = 15^{\text{h}} 22^{\text{m}}.3$ $\delta = 44^{\circ} 26'$ (8 and 9.)

1882.421	14.5	315.7	1.50	2	606	
2.429	14.0	316.1	1.54	2	606	
1884.466	14.8	314.3	1.71	3	383	
4.471	14.9	311.7	1.64	3	606	
1886.492	16.7	310.1	1.56	2	606	
6.511	15.7	310.9	1.60	2	383	
6.514	16.8	307.9	1.60	2	606	
1882.425		315.90	1.520			
1884.468		313.00	1.675			
1886.506		309.63	1.587			A slow motion in angle.

 δ Serpentis = Σ 1954. $\alpha = 15^{\text{h}} 29^{\text{m}}.1$ $\delta = 10^{\circ} 57'$ (3 and 4.)

1884.482	13.9	188.4	3.39	3	383	
4.493	14.5	188.8	3.56	2	383	
4.507	14.6	189.9	3.34	3	383	
1886.484	15.1	190.0	3.69	2	383	
6.486	15.5	189.4	3.61	2	383	
6.492	15.2	190.1	3.49	3	606	
6.511	14.8	189.1	3.42	2	383	
1889.512	16.7	189.7	3.48	2	383	
9.515	15.3	188.9	3.53	3	383	
9.523	15.3	189.6	3.60	2	383	
1884.494		189.03	3.430			
1886.493		189.65	3.552			
1889.517		189.40	5.537			An extremely slow motion.

Σ 1957.

$\alpha = 15^h 30^m.2$ $\delta = 13^\circ 18'$ (8 and 10.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	"			
1884.433	15.5	155.9	1.32	2	606	
4.460	15.8	159.9	1.25	2	383	
4.463	14.8	159.2	1.29	2	383	
1884.452		158.33	1.287			Motion doubtful.

OΣ 298.

$\alpha = 15^h 31^m.6$ $\delta = 40^\circ 13'$ (7 and 8.)

1881.402	14.6	172.4	0.32	3	888	
1.408	14.6	178.7	0.39	3	888	
1.413	13.8	175.0	0.33	3	888	
1887.453	14.1	141.2	0.38	2	606	Clouds.
7.491	14.7	143.1	0.40	2	606	
7.565	15.9	141.6	0.40	2	606	
1891.478	14.1	165.1	0.69	2	606	
1.481	14.2	169.4	0.69	2	606	
1.483	14.2	167.2	0.67	3	606	
1881.408		175.37	0.347			
1887.503		141.97	0.393			
1891.481		167.23	0.683			Perhaps a short period binary. The angle of 1881 may be reversed. An easy object in 1891.

ξ Coronæ Borealis = Σ 1965.

$\alpha = 15^h 34^m.9$ $\delta = 37^\circ 2'$ (4 and 5.)

1884.471	15.1	302.1	6.27	3	606	
4.477	14.8	302.6	6.26	3	383	
4.479	14.8	303.4	6.31	3	383	
1888.433	14.2	300.5	6.19	2	606	
8.44	14.0	302.1	6.35	3	383	
8.452	14.4	303.1	6.32	2	383	
8.458	14.0	302.1	6.26	3	606	
1884.476		302.70	6.280			
1888.446		301.95	6.280			Motion doubtful.

γ Coronæ Borealis.

$\alpha = 15^h 37^m.7$ $\delta = 26^\circ 40'$ (4 and 7.)

1891.494	14.2	127.4	0.37	3	888	At intervals well separated.
1.514	14.7	120.8	0.38	2	888	Well separated, but fuzzy.
1.522	14.9	128.8	0.31	2	888	Separated and fuzzy.
1.524	14.9	125.4	0.39	2	888	Separated at intervals.
1891.513		125.60	0.362			A period of 100 years.

Σ 1985.

$$\alpha = 15^{\text{h}} 49^{\text{m}}.8 \quad \delta = -1^{\circ} 48' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1887.423	14.5	334.2	5.86	2	383	
7.425	14.7	334.1	5.76	3	606	
7.436	14.4	334.3	5.89	3	606	
7.450	14.3	334.6	5.79	2	383	
1887.428		334.30	5.825			Perhaps a change of angle.

 Σ 1988.

$$\alpha = 15^{\text{h}} 51^{\text{m}}.3 \quad \delta = 12^{\circ} 49' \quad (8 \text{ and } 9.)$$

1887.477	14.7	261.5	2.62	2	383	
7.488	14.9	262.5	2.77	3	383	
7.491	14.9	261.3	2.70	2	383	
1887.485		261.77	2.697			Motion doubtful.

 $O\Sigma$ 303.

$$\alpha = 15^{\text{h}} 55^{\text{m}}.3 \quad \delta = 13^{\circ} 37' \quad (7 \text{ and } 8.)$$

1884.433	15.7	132.6	0.97	2	606	
4.463	15.1	136.0	0.97	2	383	
4.466	15.7	134.7	0.78	2	383	
1884.454		134.43	0.907			Motion.

 ξ Scorpii. A and B.

$$\alpha = 15^{\text{h}} 57^{\text{m}}.8 \quad \delta = -11^{\circ} 3' \quad (5 \text{ and } 5.)$$

1882.434	15.0	11.9	1.06	2	383	Blurred images.
2.437	14.9	11.2	1.17	2	606	
2.494	16.1	14.7	1.09	2	606	
1883.453	15.4	13.8	1.44	2	383	
3.573	16.3	14.0	1.32	3	383	
1884.471	15.5	15.6	1.33	2	606	
4.479	15.4	12.4	1.28	3	383	
4.507	16.1	15.8	1.27	3	606	
4.531	15.8	14.4	1.15	2	606	
4.537	15.4	14.8	1.36	2	383	

ξ **Scorpii.** *A* and *B*—Continued.

$$a = 15^h 57^m.8 \quad \delta = -11^\circ 3' \quad (5 \text{ and } 5.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	"			
1886. 560	16.0	17.9	1. 10	2	606	
6. 563	15.6	18.3	1. 03	2	606	
6. 574	16.1	17.7	1. 08	3	606	
1888. 562	16.0	20.7	0. 91	3	606	
8. 567	15.9	20.6	1. 01	3	383	
1882. 459		12.74	1. 116			
1883. 513		13.90	1. 380			
1884. 505		14.60	1. 278			
1886. 566		17.97	1. 070			
1888. 564		20.65	0. 960			A period of about 100 years.

 ξ **Scorpii.** $\frac{A \ B}{2}$ and *C*.

1882. 434	15.2	68.1	7. 34	2	383	Blurred images.
2. 437	15.0	64.7	7. 19	2	606	Blurred images; clouds.
2. 494	16.3	66.2	7. 26	2	606	
1883. 453	15.5	67.5	7. 31	2	383	
3. 573	16.4	66.5	7. 32	3	383	
1884. 479	15.5	63.6	7. 24	3	383	
4. 531	15.9	65.1	7. 28	2	606	
1886. 560	16.2	66.3	7. 31	2	606	
6. 563	15.7	65.5	7. 22	2	606	
6. 574	16.3	64.6	7. 39	3	606	
1888. 562	16.1	66.1	7. 19	3	606	
8. 567	16.0	64.5	7. 14	2	383	
1882. 455		66.33	7. 263			
1883. 513		67.00	7. 315			
1884. 505		64.35	7. 260			
1886. 566		65.47	7. 307			
1888. 564		65.30	7. 165			<i>A B C</i> form a system similar to that of ζ Cancri.

 β **Scorpii.** *A* and *B*.

$$a = 15^h 58^m.5 \quad \delta = -19^\circ 29' \quad (2 \text{ and } 10.)$$

1887. 590	16.2	103.6	1. 03	3	383	
7. 595	15.9	94.9	1. 15	3	606	
1891. 541	15.4	97.9	1. 10	2	606	Blurred.
1. 557	15.4	93.5	0. 91	2	606	Blurred.
1887. 592		99.25	1. 090			
1891. 549		95.70	1. 005			Always a difficult object to observe.

β Scorpii. *A* and *C*.

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1887.590	16.4	25.0	13.62	2	383	$\Delta p = -0^{\circ}.02$; $\Delta s = +0''.012$
7.595	16.1	24.5	13.53	2	606	
1888.562	16.3	24.4	13.67	3	383	
8.567	15.7	25.5	13.61	3	383	
1887.592		24.73	13.587			
1888.564		24.93	13.652			

 ν Scorpii. *A* and *B*.

$$a = 16^{\text{h}} 5^{\text{m}}.0 \quad \delta = -19^{\circ} 9' \quad (4 \text{ and } 7.)$$

1886.593	16.1	2.4	0.73	2	606	
6.612	16.6	3.6	0.80	2	606	
6.634	16.8	5.7	0.68	2	606	
1888.570	15.8	5.2	0.54	3	606	
8.575	16.0	4.1	0.65	3	606	
1886.613		3.90	0.737			
1888.572		4.95	0.595			A quadruple system.

 ν Scorpii. $\frac{A+B}{2}$ and *C*.

1886.593	16.3	336.90	40.81	2	606	$\Delta p = +0^{\circ}.02$; $\Delta s = +0''.034$.
6.612	16.8	336.25	40.79	2	606	
6.634	17.0	336.48	41.02	2	606	
1888.570	15.9	336.3	40.83	3	606	
8.575	16.2	336.5	40.65	3	606	
1886.613		336.56	40.907			
1888.572		336.42	40.774			

 ν Scorpii. *C* and *D*.

1886.593	16.5	47.8	2.05	2	606	Clouds.
6.612	16.9	44.8	2.02	2	606	
6.634	17.2	44.8	2.09	2	606	
1888.570	16.0	49.4	2.03	3	606	
8.575	16.3	50.0	1.87	3	606	
1886.613		45.80	2.053			
1888.572		49.70	1.950			

OΣ 306.

$$\alpha = 16^{\text{h}} 6^{\text{m}}.2 \quad \delta = 34^{\circ} 47' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1886.516	15.2	218.6	0.32	2	888	Blurred.
6.544	15.7	213.9	0.34	2	888	
6.549	15.8	219.4	0.35	2	888	
1886.540		217.04	0.340			Perhaps motion in angle.

49 Serpentis = Σ 2021.

$$\alpha = 16^{\text{h}} 7^{\text{m}}.7 \quad \delta = 13^{\circ} 51' \quad (7 \text{ and } 7.)$$

1882.434	15.4	329.1	3.98	2	383	A slow motion.
2.437	14.6	329.5	4.02	2	606	
2.494	16.6	330.3	3.77	2	606	
1884.466	15.9	329.0	3.83	3	383	
4.471	15.7	330.1	3.90	3	383	
4.477	15.1	331.8	3.96	2	383	
1887.458	15.8	331.3	3.98	2	383	
7.477	14.9	330.5	3.94	2	383	
7.488	15.2	331.1	3.84	3	383	
7.491	15.8	332.4	3.87	2	383	
1882.455		329.63	3.923			
1884.471		330.30	3.897			
1887.478		331.32	3.908			

Σ 2022.

$$\alpha = 16^{\text{h}} 7^{\text{m}}.9 \quad \delta = 26^{\circ} 58' \quad (6 \text{ and } 10.)$$

1884.479	15.2	137.2	2.83	3	383	Motion doubtful.
4.482	14.2	133.5	2.75	3	383	
4.493	14.8	137.0	2.78	2	383	
1884.485		135.90	2.787			

σ Coronæ Borealis = Σ 2032.

$$\alpha = 16^{\text{h}} 10^{\text{m}}.3 \quad \delta = 34^{\circ} 10' \quad (5 \text{ and } 6.)$$

1881.451	13.8	203.3	3.70	2	383	
1.457	15.3	203.0	3.60	2	383	
1.476	14.4	202.7	3.62	3	383	
1882.421	15.2	200.9	3.72	2	606	
2.429	15.2	201.5	3.84	2	606	
2.434	14.8	204.2	3.71	2	606	
2.437	14.3	203.8	3.72	2	383	

σ **Coronæ Borealis** = Σ **2032**—Continued. $\alpha = 16^{\text{h}} 10^{\text{m}}.3$ $\delta = 34^{\circ} 10'$ (5 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1883.444	14.8	204.2	3.79	2	383	
3.453	14.7	204.3	3.72	2	383	
3.505	15.8	205.0	3.80	2	383	
1884.479	15.0	206.3	3.76	3	383	
4.482	14.4	205.7	3.81	2	383	
4.493	15.0	205.9	3.84	2	383	
1885.424	14.5	206.2	3.92	3	383	
5.427	13.9	205.4	3.93	2	383	
5.440	14.0	205.4	3.81	2	383	
1886.448	15.5	205.7	3.89	2	606	
6.467	14.9	206.6	3.92	2	383	
6.484	15.3	207.7	3.85	2	383	
6.486	15.9	206.9	4.06	2	383	
6.492	15.3	208.1	3.98	3	606	
6.511	16.0	206.6	4.05	2	383	
1887.425	14.9	205.8	4.02	3	606	
7.436	14.7	206.0	4.05	3	606	
7.453	14.3	205.6	3.87	2	606	
7.458	15.3	204.7	4.03	2	383	
1888.430	14.8	206.6	3.92	2	383	
8.433	14.4	206.6	3.93	3	383	
8.441	14.2	206.6	3.86	3	383	
8.449	15.3	206.5	3.95	2	383	
1881.461		203.00	3.640			
1882.430		202.60	3.748			
1883.467		204.50	3.770			
1884.485		205.97	3.803			
1885.430		205.67	3.887			
1886.481		206.93	3.958			
1887.443		205.52	3.992			
1888.438		206.58	3.915			A very slow motion.

 Σ **2041.** $\alpha = 16^{\text{h}} 16^{\text{m}}.3$ $\delta = 1^{\circ} 31'$ (7 and 10.)

1884.466	16.2	1.8	2.71	3	383	
4.471	16.0	1.7	2.69	3	383	
1885.424	14.9	0.4	2.86	3	383	
5.427	14.2	0.0	2.79	2	383	
5.440	15.1	0.9	2.84	2	383	
1884.468		1.75	2.700			
1885.430		0.43	2.830			Motion doubtful.

Antares.

$$\alpha = 16^{\text{h}} 22^{\text{m}}.1 \quad \delta = -26^{\circ} 10' \quad (1 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884.479	15.8	273.5	3.38	3	383	Thin clouds.
4.559	15.5	272.3	3.11	2	383	
1886.552	15.4	270.4	2.96	2	383	
6.555	15.5	270.3	2.81	2	383	
6.558	15.4	270.1	2.88	2	383	
1884.519		272.90	3.245			Clouds.
1886.555		270.27	2.883			

 Σ 2054.

$$\alpha = 16^{\text{h}} 22^{\text{m}}.2 \quad \delta = 61^{\circ} 58' \quad (6 \text{ and } 7.)$$

1885.424	14.2	1.4	1.17	2	606	Perhaps a slow motion.
5.440	13.7	0.2	1.02	2	383	
5.465	15.1	359.0	1.07	2	383	
1885.443		0.20	1.087			

 Σ 2049.

$$\alpha = 16^{\text{h}} 22^{\text{m}}.6 \quad \delta = 26^{\circ} 15' \quad (7 \text{ and } 8.)$$

1886.516	15.7	210.4	0.96	2	606	Clouds.
6.522	15.4	209.8	1.04	3	606	
6.525	15.4	210.6	1.10	2	606	
1887.477	15.1	209.6	1.09	2	383	
7.488	15.4	209.0	1.13	2	383	
7.521	15.4	206.9	0.94	3	383	
7.529	15.4	211.6	1.19	2	383	
1886.521		210.27	1.033			
1887.504		209.28	1.088			Motion doubtful.

Σ 2052.

$$\alpha = 16^{\text{h}} 23^{\text{m}}.6 \quad \delta = 18^{\circ} 40' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884.479	16.0	99.0	2.37	3	383	
4.482	14.6	99.7	2.50	2	383	
4.493	15.2	98.9	2.53	2	383	
1884.485		99.20	2.467			Motion in angle.

 λ Ophiuchi = Σ 2055.

$$\alpha = 16^{\text{h}} 24^{\text{m}}.9 \quad \delta = 2^{\circ} 15' \quad (4 \text{ and } 6.)$$

1881.522	15.4	40.7	1.45	3	606	
1.531	16.1	38.1	1.37	2	383	
1.536	16.3	36.0	1.49	2	606	
1.588	16.8	36.0	1.43	2	606	
1882.494	16.8	39.1	1.55	2	606	
2.511	15.4	40.6	1.50	2	606	Clouds.
2.514	15.9	34.6	1.50	2	606	
2.519	15.8	41.4	1.37	3	606	
1883.568	16.4	36.4	1.57	2	383	
3.573	16.6	39.5	1.57	2	383	
3.581	16.4	38.1	1.44	2	383	
3.592	16.3	39.5	1.72	2	383	
3.598	16.4	39.0	1.57	2	383	
1884.471	16.2	43.3	1.53	2	383	
4.477	15.3	43.7	1.43	2	383	
4.479	16.2	43.0	1.56	3	383	
1885.440	15.4	43.8	1.45	2	383	
5.495	14.5	42.8	1.58	2	606	Windy.
5.503	15.4	44.9	1.45	2	383	
5.514	15.5	44.9	1.43	2	383	Clouds.
1886.516	16.0	45.7	1.39	2	606	
6.522	16.0	37.3	1.45	2	606	
6.525	16.6	40.7	1.29	2	606	
6.530	17.1	40.5	1.42	2	606	
6.541	15.7	44.5	1.41	2	383	
1887.453	15.3	44.7	1.46	3	383	
7.477	15.3	45.3	1.45	2	383	
7.488	15.6	46.6	1.40	2	383	
7.521	15.6	45.6	1.31	3	383	
1888.441	14.5	47.1	1.31	2	383	
8.458	15.3	45.7	1.33	3	606	
8.469	15.2	46.3	1.21	3	383	
8.471	15.3	48.2	1.37	2	383	
8.504	15.1	46.3	1.43	3	383	
8.507	14.8	43.9	1.53	2	383	
8.534	15.5	44.6	1.41	2	383	

λ Ophiuchi = Σ 2055—Continued

$$\alpha = 16^{\text{h}} 24^{\text{m}}.9 \quad \delta = 2^{\circ} 15' \quad (4 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1891. 483	15. 1	48. 1	1. 36	2	606	
1. 494	15. 2	48. 8	1. 40	3	606	
1. 514	15. 1	47. 2	1. 38	2	606	
1. 522	15. 3	46. 9	1. 42	3	606	
1. 524	15. 4	47. 2	1. 41	2	606	
1881. 544		37. 70	1. 435			
1882. 509		38. 92	1. 480			
1883. 582		38. 50	1. 574			
1884. 476		43. 33	1. 507			
1885. 489		44. 10	1. 478			
1886. 527		41. 74	1. 392			
1887. 485		45. 55	1. 405			
1888. 483		46. 01	1. 370			
1891. 507		47. 64	1. 394			A binary of long period.

 Σ 3105.

$$\alpha = 16^{\text{h}} 25^{\text{m}}.5 \quad \delta = -6^{\circ} 47' \quad (8 \text{ and } 8.)$$

1884. 479	16. 4	46. 1	0. 47	3	888	
4. 548	16. 3	47. 7	0. 36	2	888	
4. 556	16. 2	41. 5	0. 41	2	888	
1888. 545	15. 9	37. 9	0. 46	3	606	
8. 548	16. 4	40. 5	0. 45	3	606	
8. 556	16. 0	43. 1	0. 45	3	606	
1884. 528		45. 10	0. 413			
1888. 550		40. 50	0. 453			Motion in angle.

 $O\Sigma$ 313.

$$\alpha = 16^{\text{h}} 28^{\text{m}}.6 \quad \delta = 40^{\circ} 21' \quad (7 \text{ and } 8.)$$

1884. 507	15. 1	152. 2	0. 90	3	606	
4. 523	15. 1	153. 6	0. 90	3	606	
4. 526	15. 2	152. 3	0. 93	3	606	
1884. 519		152. 70	0. 910			Perhaps motion in angle.

 Σ 2080.

$$\alpha = 16^{\text{h}} 34^{\text{m}}.4 \quad \delta = 38^{\circ} 34' \quad (8 \text{ and } 12.)$$

1884. 507	15. 3	27. 5	3. 85	3	383	
4. 523	15. 5	26. 7	3. 80	3	607	
1884. 515		27. 10	3. 825			Diminution of distance.

ζ **Herculis** = Σ **2084.** $\alpha = 16^h 36^m.8$ $\delta = 31^\circ 49'$ (3 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1881. 476	14. 8	110. 3	1. 49	2	606	Blurred images.
1. 503	15. 0	110. 8	1. 40	3	606	
1. 512	16. 5	110. 4	1. 59	2	606	
1. 522	15. 1	111. 5	1. 27	3	606	
1. 531	15. 9	109. 8	1. 40	2	606	
1882. 514	16. 6	109. 6	1. 51	3	606	
2. 519	16. 0	108. 0	1. 28	3	606	
2. 525	15. 8	108. 5	1. 50	2	606	
2. 527	16. 0	102. 7	1. 53	2	606	
2. 538	15. 6	102. 8	1. 39	2	606	
1883. 453	15. 1	103. 4	1. 57	2	383	
3. 554	15. 3	103. 2	1. 41	3	606	
3. 573	16. 1	100. 8	1. 57	3	383	
3. 581	15. 7	103. 5	1. 45	3	383	
3. 592	16. 0	101. 0	1. 57	2	383	
1884. 507	15. 5	93. 7	1. 76	3	606	Thin clouds.
4. 523	15. 3	95. 0	1. 49	3	606	
4. 526	15. 5	94. 2	1. 77	2	383	
4. 531	14. 8	94. 7	1. 56	3	606	
4. 537	15. 2	96. 0	1. 59	2	383	
1885. 495	15. 6	95. 2	1. 89	2	383	
5. 503	15. 6	90. 3	1. 77	3	383	
5. 514	15. 8	93. 1	1. 69	2	383	
5. 523	14. 7	92. 1	1. 47	3	383	
5. 531	14. 9	91. 0	1. 47	3	383	
5. 536	14. 8	90. 7	1. 48	3	383	
5. 553	15. 0	91. 6	1. 50	3	383	
1886. 516	16. 2	87. 7	1. 44	2	606	
6. 522	15. 7	89. 5	1. 46	3	606	
6. 541	15. 5	90. 9	1. 72	2	383	
6. 544	15. 2	86. 9	1. 48	3	383	
6. 549	15. 3	89. 1	1. 47	3	606	
6. 552	15. 2	88. 5	1. 42	3	383	
1887. 453	15. 5	89. 4	1. 83	3	383	
7. 521	15. 8	83. 8	1. 63	2	383	
7. 565	15. 6	82. 5	1. 56	3	383	
7. 571	16. 5	82. 1	1. 47	2	606	
7. 573	16. 1	81. 8	1. 53	2	606	
7. 590	16. 0	82. 3	1. 53	3	606	
1888. 469	15. 5	81. 2	1. 53	3	383	
8. 504	15. 4	78. 4	1. 65	2	383	
8. 507	14. 6	80. 9	1. 50	2	383	
8. 515	14. 9	78. 2	1. 55	2	383	
8. 534	15. 3	76. 3	1. 50	2	383	
8. 537	15. 1	77. 1	1. 39	3	383	

ζ **Herculis** = Σ **2084**—Continued.

$$\alpha = 16^{\text{h}} 36^{\text{m}}.8 \quad \delta = 31^{\circ} 49' \quad (3 \text{ and } 6.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1889.515	15.4	73.8	1.49	2	383	
9.526	15.4	72.8	1.56	2	606	
9.531	14.9	71.4	1.51	2	606	
9.539	15.1	72.1	1.52	2	383	
9.542	15.2	70.5	1.44	2	606	
9.553	15.2	74.0	1.44	3	383	
1890.470	14.4	69.0	1.47	2	606	
0.498	14.6	68.1	1.40	2	606	
0.517	15.1	67.8	1.48	2	606	
0.525	15.1	67.2	1.48	3	606	
0.528	14.8	70.9	1.60	2	606	
0.536	14.9	68.0	1.50	3	606	
1891.494	15.4	65.6	1.35	2	606	
1.514	14.9	65.4	1.45	2	606	
1.522	15.1	64.1	1.30	2	606	
1.524	15.1	64.	1.29	3	606	
1.541	15.3	63.4	1.41	2	606	
1.555	15.3	62.7	1.32	2	666	
1881.509		110.56	1.430			
1882.525		106.32	1.442			
1883.551		102.38	1.514			
1884.525		94.72	1.634			
1885.522		92.00	1.610			
1886.537		88.77	1.498			
1887.546		83.65	1.592			
1888.511		78.68	1.520			
1889.534		72.43	1.493			
1890.512		68.50	1.488			
1891.525		64.27	1.353			
Σ 2091. $\alpha = 16^{\text{h}} 38^{\text{m}}.2 \quad \delta = 41^{\circ} 26' \quad (7 \text{ and } 8.)$						
1887.453	15.8	305.3	0.94	2	606	Cloudy.
7.477	15.5	306.7	1.03	2	383	
7.488	15.8	309.0	0.91	2	383	
1890.470	14.7	304.5	0.99	2	606	
0.481	15.1	305.0	0.93	2	606	
1887.473		307.00	0.960			An apparent diminution of distance.
1890.476		304.75	0.960			

Σ 2089.

$$a = 16^h 38^m.4 \quad \delta = 25^\circ 22' \quad (8 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1884. 507	h. 15.8	° 66.9	' 2.53	3	606	Motion doubtful.
4. 523	15.8	67.3	2.66	3	606	
1884. 515		67.10	2.595			

 Σ 2106.

$$a = 16^h 45^m.4 \quad \delta = 9^\circ 36' \quad (7 \text{ and } 8.)$$

1884. 479	16.8	314.3	0.54	3	606	Motion.
4. 507	16.6	313.3	0.39	3	888	
4. 531	15.5	313.8	0.56	2	606	
1886. 522	16.3	310.5	0.38	2	888	
6. 544	16.0	312.7	0.39	2	888	
6. 549	16.0	320.6	0.32	2	888	
1884. 506		313.80	0.497			
1886. 538		314.60	0.363			

Anonyma.

$$a = 16^h 45^m.4 \quad \delta = 9^\circ 36'$$

1886. 516	16.5	183.9	0.37	2	888	This star was observed for Σ 2106. Probably a mistake in setting the telescope.
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 Σ 2107.

$$a = 16^h 47^m.1 \quad \delta = 28^\circ 52' \quad (7 \text{ and } 9.)$$

1881. 522	15.7	229.5	0.49	3	888	A motion shown by the observations.
1. 536	16.6	227.8	0.38	2	888	
1888. 592	16.5	253.6	0.40	3	606	
8. 603	16.7	254.5	0.35	3	888	
1881. 529		228.65	0.435			
1888. 598		254.05	0.375			

 Σ 2114.

$$a = 16^h 56^m.2 \quad \delta = 8^\circ 37' \quad (6 \text{ and } 7.)$$

1884. 493	16.3	156.4	1.41	2	383	Motion in angle.
4. 507	16.8	155.9	1.21	3	606	
4. 523	16.1	155.7	1.30	3	323	
1884. 508		156.00	1.307			

Σ 2120. $\alpha = 17^{\text{h}} 0^{\text{m}}.0$ $\delta = 28^{\circ} 16'$ (7 and 9.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 545	16. 6	251. 6	5. 11	2	606	
0. 575	16. 3	252. 9	5. 09	2	606	
1881. 476	15. 1	253. 8	5. 36	2	606	
1. 503	15. 2	252. 9	5. 46	3	606	
1. 512	16. 8	251. 1	5. 26	2	606	
1882. 514	17. 0	251. 1	5. 48	3	606	
2. 519	16. 3	251. 1	5. 46	3	606	
1883. 568	16. 8	252. 1	5. 44	3	383	
3. 573	16. 8	252. 3	5. 58	3	383	
3. 581	16. 6	251. 2	5. 59	3	383	
1884. 531	16. 4	251. 0	5. 59	3	383	
4. 537	16. 0	250. 9	5. 62	3	383	
4. 542	16. 4	251. 9	5. 87	2	383	Images blurred.
1885. 514	16. 1	250. 4	5. 74	2	383	
5. 520	15. 7	250. 1	5. 73	2	383	
1886. 486	16. 2	248. 9	5. 91	2	383	
6. 492	17. 0	248. 2	5. 93	3	606	
6. 511	16. 3	248. 5	5. 86	3	383	
6. 514	17. 5	248. 5	5. 89	2	606	
1888. 545	16. 6	247. 1	6. 29	3	606	
8. 548	16. 6	246. 2	6. 15	3	606	
8. 556	16. 2	248. 4	6. 14	3	606	
1880. 560		252. 25	5. 100			
1881. 497		252. 60	5. 360			
1882. 516		251. 10	5. 470			
1883. 574		251. 87	5. 537			
1884. 537		251. 27	5. 693			
1885. 517		250. 25	5. 735			
1886. 501		248. 52	5. 897			
1888. 550		247. 23	6. 193			A nearly rectilinear motion.

 μ Draconis = Σ 2130. $\alpha = 17^{\text{h}} 2^{\text{m}}.8$ $\delta = 54^{\circ} 38'$ (5 and 5.)

1885. 580	17. 2	162. 6	2. 52	3	606	
5. 583	16. 3	163. 9	2. 53	2	383	
5. 597	16. 3	160. 5	2. 55	2	383	
1889. 542	15. 5	158. 5	2. 41	2	383	
9. 545	15. 7	158. 1	2. 49	3	383	
9. 553	15. 4	159. 0	2. 49	3	383	
1885. 587		162. 33	2. 533			
1889. 547		158. 53	2. 463			Motion.

36 Ophiuchi.

$$\alpha = 17^{\text{h}} 8^{\text{m}}.0 \quad \delta = -26^{\circ} 25' \quad (5 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks
	h.	°	"			
1882. 538	16. 2	199. 5	4. 38	2	383	Images blurred.
2. 560	16. 1	197. 5	4. 38	2	383	
2. 566	16. 8	202. 5	4. 31	2	383	
2. 571	17. 0	201. 3	4. 48	2	383	
1883. 568	17. 1	199. 8	4. 69	2	383	
3. 573	17. 1	199. 8	4. 45	3	383	
3. 601	16. 7	199. 9	4. 62	2	383	
1884. 526	17. 0	200. 6	4. 57	2	383	
4. 531	16. 9	199. 8	4. 65	2	383	
1886. 522	16. 7	198. 0	4. 40	2	383	
6. 541	17. 2	199. 2	4. 47	2	383	
6. 544	16. 6	197. 6	4. 37	2	383	
1888. 589	17. 1	197. 5	4. 33	3	383	
8. 592	16. 7	197. 0	4. 34	3	383	
1882. 559		200. 20	4. 388			
1883. 581		199. 83	4. 587			
1884. 528		200. 20	4. 610			
1886. 536		198. 27	4. 413			
1888. 590		197. 25	4. 335			A slow motion.

 α Herculis = Σ 2140.

$$\alpha = 17^{\text{h}} 9^{\text{m}}.2 \quad \delta = 14^{\circ} 32' \quad (3 \text{ and } 6.)$$

1886. 656	18. 1	117. 4	4. 72	3	383	No motion.
6. 659	17. 6	117. 6	4. 67	2	383	
6. 667	17. 3	117. 2	4. 64	2	383	
1886. 661		117. 40	4. 677			

 Σ 3127.

$$\alpha = 17^{\text{h}} 10^{\text{m}}.0 \quad \delta = 24^{\circ} 58' \quad (3 \text{ and } 8.)$$

1884. 526	16. 4	185. 4	17. 06	2	383	$\Delta p = 0^{\circ}.00$; $\Delta s = + 0''.005$.
4. 531	16. 7	185. 7	16. 94	2	383	
1884. 528		185. 55	17. 005			

Diminution of distance.

 Σ 2153.

$$\alpha = 17^{\text{h}} 14^{\text{m}}.8 \quad \delta = 49^{\circ} 26' \quad (8 \text{ and } 9.)$$

1884. 537	16. 3	271. 3	1. 95	3	383	Motion doubtful.
4. 542	16. 2	275. 2	1. 88	2	383	
4. 548	16. 0	271. 1	2. 00	3	383	
1884. 542		272. 53	1. 943			

Σ 2156.

$$\alpha = 17^{\text{h}} 17^{\text{m}}.8 \quad \delta = -0^{\circ} 43' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks
	h.	$^{\circ}$	$''$			
1884. 523	16. 4	36. 9	3. 44	2	383	
4. 526	16. 7	36. 5	3. 30	2	383	
1886. 522	17. 0	37. 3	3. 32	3	383	
6. 544	16. 3	35. 4	3. 51	2	606	
6. 549	16. 2	35. 6	3. 42	2	606	Clouds.
1884. 524		36. 70	3. 370			
1886. 538		36. 10	3. 417			Apparently a slow motion in angle

 Σ 2160.

$$\alpha = 17^{\text{h}} 19^{\text{m}}.1 \quad \delta = 15^{\circ} 43' \quad (6 \text{ and } 10.)$$

1884. 531	17. 1	68. 5	3. 89	3	383	
4. 537	16. 6	68. 8	3. 83	2	383	
4. 542	16. 7	69. 4	3. 86	2	383	Images blurred.
1884. 537		68. 90	3. 860			Probably a very slow motion.

 Σ 2161.

$$\alpha = 17^{\text{h}} 19^{\text{m}}.5 \quad \delta = 37^{\circ} 16' \quad (4 \text{ and } 6.)$$

1884. 548	16. 8	309. 0	3. 88	3	383	
4. 556	16. 7	310. 4	4. 07	2	383	
4. 559	16. 1	312. 7	4. 04	2	383	
1884. 554		310. 70	3. 997			Motion doubtful.

 Σ 2163.

$$\alpha = 17^{\text{h}} 19^{\text{m}}.6 \quad \delta = 42^{\circ} 16' \quad (10 \text{ and } 10.)$$

1884. 548	16. 5	95. 1	1. 47	3	383	
4. 556	16. 5	97. 5	1. 47	2	383	
4. 559	16. 4	94. 2	1. 63	3	383	
1884. 554		95. 60	1. 523			Perhaps a slow motion.

 Σ 2171.

$$\alpha = 17^{\text{h}} 22^{\text{m}}.7 \quad \delta = -9^{\circ} 54' \quad (7 \text{ and } 8.)$$

1884. 531	17. 3	250. 0	1. 37	2	383	
4. 536	16. 8	249. 5	1. 64	2	383	Images blurred.
4. 547	17. 3	249. 6	1. 44	2	383	Clouds.
1884. 538		249. 74	1. 452			Perhaps a slow motion

Σ 2173.

$$\alpha = 17^{\text{h}} 24^{\text{m}}.2 \quad \delta = -0^{\circ} 58' \quad (6 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	o	//			
1881. 522	16. 1	301. 5	0. 27	2	888	Not separated.
1884. 619	17. 0	190. 4	0. 31	3	888	
4. 625	17. 0	190. 2	0. 31	2	888	
4. 633	16. 9	189. 2	0. 34	3	888	
1886. 560	16. 6	174. 1	0. 41	2	888	
6. 563	16. 1	170. 9	0. 42	2	888	
6. 574	16. 7	173. 9	0. 42	3	888	
1888. 545	16. 8	163. 9	0. 51	3	606	
8. 548	16. 8	164. 0	0. 56	3	606	
8. 556	16. 5	165. 2	0. 51	3	606	
1891. 494	16. 1	161. 3	0. 97	2	606	
1. 514	15. 9	159. 4	0. 91	2	606	
1. 522	15. 7	159. 6	1. 04	2	606	
1881. 522		301. 5	0. 27			Doubtful.
1884. 626		189. 93	0. 320			
1886. 566		172. 97	0. 417			
1888. 550		164. 37	0. 527			
1891. 510		160. 10	0. 973			Apparent motion.

 $O\Sigma$ 331.

$$\alpha = 17^{\text{h}} 24^{\text{m}}.5 \quad \delta = 3^{\circ} 0' \quad (8 \text{ and } 9.)$$

1886. 544	16. 9	336. 1	0. 96	2	606	Clouds.
6. 549	16. 7	336. 9	0. 98	2	606	
6. 552	15. 7	335. 5	0. 88	2	606	
1827. 548		336. 17	0. 940			A slow motion.

 Σ 2185. *A* and *B*.

$$\alpha = 17^{\text{h}} 28^{\text{m}}.9 \quad \delta = 6^{\circ} 7' \quad (7 \text{ and } 10.)$$

1884. 559	17. 0	4. 8	27. 77	2	383	$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.011.$
4. 562	16. 2	4. 6	27. 90	3	383	
1885. 599	16. 6	4. 5	27. 82	3	606	
5. 610	17. 4	5. 2	27. 77	3	383	
5. 616	17. 0	5. 4	27. 66	3	383	
1884. 560		4. 70	27. 846			No motion.
1885. 608		5. 03	27. 761			

Σ 2185. A and C.

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1884. 559	17. 2	197. 5	90. 27	2	383	
4. 562	16. 6	197. 5	90. 26	3	383	
1885. 599	16. 8	197. 92	89. 99	3	606	
5. 610	17. 6	198. 02	90. 14	3	383	
5. 616	17. 3	198. 12	89. 93	3	383	$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.034.$
1884. 560		197. 50	90. 299			
1885. 608		198. 02	90. 054			Motion.

 Σ 2190.

$$\alpha = 17^{\text{h}} 30^{\text{m}}.9 \quad \delta = 21^{\circ} 4' \quad (6 \text{ and } 9.)$$

1884. 556	17. 0	23. 5	10. 44	3	383	
4. 559	16. 6	24. 5	10. 35	2	383	
1884. 558		24. 00	10. 395			
	$\Delta p =$	0. 00	+ 0. 003			
		24. 00	10. 398			Motion doubtful.

 Σ 2192.

$$\alpha = 17^{\text{h}} 35^{\text{m}}.4 \quad \delta = 29^{\circ} 18' \quad (7 \text{ and } 10.)$$

1884. 562	17. 2	69. 2	10. 77	3	383	
4. 581	16. 3	68. 7	10. 71	3	383	
1884. 572		68. 95	10. 740			
	$\Delta p =$	0. 00	+ 0. 003			
		68. 95	10. 743			Motion in angle.

 Σ 2199.

$$\alpha = 17^{\text{h}} 36^{\text{m}}.4 \quad \delta = 55^{\circ} 49' \quad (7 \text{ and } 8.)$$

1885. 580	17. 4	95. 7	1. 59	3	606	
5. 583	16. 5	95. 7	1. 53	3	383	
5. 597	16. 6	94. 3	1. 50	2	383	
1885. 587		95. 23	1. 540			Motion in angle.

Σ 2203.

$\alpha = 17^h 37^m.9$ $\delta = 41^\circ 43'$ (7 and 8.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	''			
1884.581	16.7	326.0	0.66	3	606	
4.589	16.8	324.2	0.72	3	606	
4.597	16.7	325.2	0.66	3	606	
1884.589		325.13	0.680			Perhaps motion in angle.

Σ 2214. *A* and *B*.

$\alpha = 17^h 39^m.8$ $\delta = 43^\circ 47'$ (8 and 9.)

1884.581	17.0	213.3	19.61	3	606	
4.589	17.1	213.1	19.53	2	606	
1884.585	$\Delta \rho =$	213.20	19.570			
		0.00	+ 0.006			
		213.20	19.576			No motion.

Σ 2214. *B* and *C*. (9 and 10.)

1884.581	17.2	144.2	1.26	3	606	
4.589	17.3	142.4	1.34	3	606	
1884.585		143.30	1.300			

Σ 2205.

$\alpha = 17^h 40^m.4$ $\delta = 17^\circ 45'$

1884.556	17.4	302.2	2.26	2	383	
4.559	17.6	302.7	2.15	2	383	
4.562	16.9	302.3	2.23	3	383	
1884.559		302.40	2.213			Motion in angle.

Σ 2215.

$\alpha = 17^h 41^m.6$ $\delta = 17^\circ 46'$ (6 and 8.)

1884.597	17.3	297.1	0.84	3	606	
4.605	16.8	294.6	0.85	2	606	
4.616	17.4	299.5	0.76	3	606	
1884.606		297.07	0.817			Motion in angle.

μ^1 **Herculis.** $\alpha = 17^h 41^m.8$ $\delta = 27^\circ 48'$ (10 and 11.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1880. 581	16. 5	245. 9	0. 95	2	606	
o. 603	17. 6	246. 3	1. 09	2	606	
o. 712	18. 3	245. 6	0. 98	3	606	
o. 718	18. 6	247. 3	1. 00	3	606	
1881. 503	15. 9	249. 8	1. 00	2	606	
1. 522	17. 0	250. 6	1. 10	3	888	
1. 536	16. 9	250. 5	1. 12	2	606	
1. 588	17. 1	245. 5	0. 93	2	606	
1. 591	17. 2	249. 0	0. 89	2	606	
1882. 514	17. 6	256. 9	0. 74	2	606	Observation difficult.
2. 519	16. 6	258. 1	0. 72	2	888	
2. 525	16. 7	264. 1	0. 66	2	606	
2. 538	16. 5	257. 4	0. 69	2	606	
1883. 573	17. 3	262. 9	0. 64	3	606	
3. 581	17. 0	264. 7	0. 61	2	606	
3. 598	16. 7	261. 2	0. 74	2	383	
1884. 635	18. 2	274. 3	0. 64	2	606	
4. 638	17. 9	272. 4	0. 67	3	606	
4. 657	18. 0	273. 4	0. 64	2	606	
1885. 553	15. 7	286. 2	0. 59	2	606	
5. 561	15. 9	288. 5	0. 59	2	888	Faint.
5. 564	16. 4	289. 4	0. 65	3	888	
1886. 555	16. 2	303. 9	0. 39	2	888	
6. 560	16. 4	303. 7	0. 41	2	888	
6. 574	16. 5	300. 2	0. 35	2	888	Faint.
6. 640	17. 6	292. 2	0. 38	3	888	Faint; perhaps an error of 10° in angle, but the record is plain.
6. 651	17. 7	300. 6	0. 40	2	888	
1887. 565	16. 4	319. 8	0. 45	3	606	
7. 571	16. 8	322. 3	9. 41	3	606	Faint.
7. 595	16. 8	322. 3	0. 41	3	606	
1888. 611	16. 8	337. 3	0. 36	2	606	
8. 625	17. 1	338. 5	0. 37	3	606	
8. 649	17. 4	342. 9	0. 40	3	606	
8. 652	17. 5	347. 1	0. 42	3	606	
1889. 630	17. 2	356. 5	0. 29	2	888	Blurred.
9. 649	18. 2	0. 8	0. 33	3	888	Elongated.
9. 663	18. 3	1. 5	0. 32	3	888	
9. 665	17. 9	3. 7	0. 44	3	888	Well separated.
1890. 536	15. 7	12. 9	0. 46	3	606	
o. 542	15. 8	13. 6	0. 54	2	606	
o. 555	15. 8	13. 7	0. 52	2	888	
o. 577	16. 3	12. 7	0. 53	2	606	
1891. 557	16. 5	23. 0	0. 47	2	888	

μ^1 **Herculis**—Continued.

$$\alpha = 17^{\text{h}} 41^{\text{m}}.8 \quad \delta = 27^{\circ} 48' \quad (10 \text{ and } 11.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1891. 571	h. 16. 2	° 24. 2	'' 0. 57	3	888	Faint.
1. 577	17. 0	26. 0	0. 58	2	888	
1. 582	16. 7	26. 1	0. 54	2	888	
1880. 654		246. 28	1. 005			This faint double star was discovered by ALVAN CLARK in 1856. An observation by DAWES gives, 1857 5, $p = 59^{\circ}.3$, $s = 1''.82$. The motion in angle indicates a period of less than 50 years. This star is interesting on account of the faintness of the components: and their rapid motion.
1881. 548		249. 08	1. 008			
1882. 524		259. 12	0. 702			
1883. 584		262. 93	0. 663			
1884. 643		273. 37	0. 650			
1885. 559		288. 03	0. 610			
1886. 596		300. 12	0. 386			
1887. 577		321. 47	0. 423			
1888. 634		341. 45	0. 388			
1889. 651		0. 62	0. 345			
1890. 552		13. 22	0. 512			
1891. 572		24. 82	0. 540			

 μ^2 **Herculis.** A and $\frac{BC}{2}$.

$$\alpha = 17^{\text{h}} 42^{\text{m}}.0 \quad \delta = 27^{\circ} 48' \quad (4 \text{ and } 10.)$$

1886. 607	17. 1	244. 00	31. 49	3	383	Probably a triple system.
6. 612	17. 3	243. 75	31. 52	2	606	
6. 634	17. 5	243. 62	31. 39	2	606	
1886. 618	$\Delta p =$	243. 79	31. 467			
		0. 00	+ 0. 009			
		243. 79	31. 476			

OΣ 337.

$$\alpha = 17^{\text{h}} 44^{\text{m}}.8 \quad \delta = 7^{\circ} 17' \quad (7 \text{ and } 8.)$$

1884. 619	17. 4	286. 4	0. 39	3	888	Perhaps a motion in angle.
4. 625	17. 2	288. 4	0. 38	3	888	
4. 633	18. 2	289. 7	0. 42	3	888	
1884. 626		288. 17	0. 397			

OΣ 338.

$$\alpha = 17^{\text{h}} 46^{\text{m}}.5 \quad \delta = 15^{\circ} 21' \quad (7 \text{ and } 7.)$$

1884. 638	18. 2	199. 6	0. 76	3	606	Motion in angle.
4. 657	18. 2	201. 7	0. 72	2	606	
4. 663	17. 7	202. 1	0. 86	3	606	
1884. 653		201. 13	0. 780			

Σ 2242.

$\alpha = 17^h 48^m.1$ $\delta = 44^\circ 56'$ (7 and 8.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887.521	h 16.1	° 146.1	// 3.52	3	383	No motion.
7.565	16.6	146.8	3.56	3	606	
7.571	17.0	146.2	3.53	2	606	
1887.552		146.37	3.537			

G. A. 6.

$\alpha = 17^h 49^m.9$ $\delta = 29^\circ 50'$ (8 and 9.)

1884.597	17.1	62.0	0.38	3	888	Clouds.
4.600	16.9	59.9	0.36	2	888	
1884.598		60.95	0.370			

A. C. 9.

$\alpha = 17^h 49^m.9$ $\delta = 29^\circ 50'$ (8 and 9.)

1884.600	17.2	232.4	1.00	3	606	No motion.
4.605	17.1	231.1	1.05	2	606	
4.616	17.0	233.6	1.04	3	606	
1884.607		232.37	1.030			

Σ 2264.

$\alpha = 17^h 56^m.5$ $\delta = 21^\circ 35'$ (5 and 5.)

1887.521	16.3	80.0	6.19	2	383	No motion.
7.565	17.1	80.0	6.21	2	606	
7.571	17.2	78.8	6.27	2	606	
1887.552		79.60	6.223			

τ Ophiuchi = Σ 2262.

$\alpha = 17^h 56^m.5$ $\delta = -8^\circ 11'$ (5 and 6.)

1880.603	17.8	250.8	1.59	2	606	
0.718	18.9	251.4	1.70	2	383	
1881.522	17.4	251.3	1.75	3	606	
1.536	17.2	251.0	1.66	2	606	
1.588	17.4	251.6	1.73	2	606	

τ Ophiuchi = Σ 2262—Continued.

$$\alpha = 17^{\text{h}} 56^{\text{m}}.5 \quad \delta = -8^{\circ} 11' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1882. 519	17. 1	253. 0	1. 68	2	606	
2. 538	17. 2	252. 3	1. 76	2	383	
2. 560	16. 4	254. 5	1. 76	2	383	
1883. 568	17. 9	254. 0	. .	2	383	
3. 573	17. 5	253. 3	1. 82	3	383	
3. 581	17. 2	253. 2	1. 71	2	383	
3. 592	17. 2	253. 5	1. 81	2	383	
3. 598	17. 0	253. 2	1. 79	2	383	
1884. 581	18. 1	253. 8	1. 90	2	383	
4. 597	17. 8	252. 3	1. 68	2	606	
4. 614	18. 3	252. 9	1. 89	2	383	
1885. 553	16. 4	253. 2	1. 65	2	606	
5. 561	16. 4	252. 5	1. 68	2	606	
5. 564	16. 9	254. 2	1. 68	3	606	
5. 566	16. 8	254. 0	1. 61	2	606	
1886. 522	18. 3	255. 3	1. 60	2	383	
6. 541	17. 7	252. 9	1. 71	2	383	
6. 544	17. 4	252. .	1. 64	2	383	
6. 552	17. 0	254. 7	1. 74	2	606	Cloudy.
1887. 521	16. 6	252. 4	1. 84	2	383	
7. 565	17. 4	251. 8	1. 78	2	606	
7. 590	16. 8	253. 5	1. 74	3	383	
7. 625	17. 8	252. 3	1. 88	2	383	
1888. 545	17. 7	252. 9	1. 81	2	383	
8. 556	17. 3	253. 0	1. 60	3	606	
8. 562	17. 5	253. 8	1. 69	2	383	
8. 570	17. 8	252. 7	1. 62	3	383	Clouds.
8. 586	17. 2	253. 3	1. 79	2	383	
1880. 660		251. 10	1. 645			
1881. 549		251. 30	1. 713			
1882. 539		253. 27	1. 733			
1883. 582		253. 44	1. 782			
1884. 597		253. 00	1. 823			
1885. 561		253. 48	1. 655			
1886. 540		253. 95	1. 672			
1887. 575		252. 50	1. 810			
1888. 564		253. 14	1. 702			A binary of long period.
Σ 2271.						
$\alpha = 17^{\text{h}} 57^{\text{m}}.7 \quad \delta = 52^{\circ} 53' \quad (8 \text{ and } 9.)$						
1885. 580	17. 6	267. 9	2. 16	3	606	
5. 583	16. 7	268. 3	2. 29	3	383	
5. 597	16. 8	268. 3	2. 23	2	383	
1885. 587		268. 17	2. 227			Perhaps a slow motion.

Σ 2267.

$\alpha = 17^h 57^m.8 \quad \delta = 40^\circ 11'$ (8 and 9.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	''			
1884. 619	17. 2	241. 8	1. 16	3	606	
4. 622	17. 2	239. 5	1. 10	2	606	
4. 625	17. 4	241. 1	1. 08	4	606	
1884. 622		240. 80	1. 113			Apparently a slow motion in angle.

Σ 2266.

$\alpha = 17^h 58^m.3 \quad \delta = 3^\circ 30'$ (8 and 10.)

1886. 555	16. 6	184. 6	8. 62	3	606	
6. 560	16. 8	184. 4	8. 91	2	606	
6. 363	16. 4	184. 5	8. 70	3	383	
1886. 559		184. 50	8. 743			No motion.

70 Ophiuchi = Σ 2272.

$\alpha = 17^h 59^m.4 \quad \delta = 2^\circ 33'$ (5 and 6.)

1880. 545	17. 0	65. 9	2. 72	2	383	
0. 572	18. 0	67. 2	2. 79	2	383	
0. 575	17. 6	6 . 3	2. 77	2	383	
0. 581	17. 3	65. 7	2. 88	3	383	
0. 583	18. 0	65. 5	2. 68	2	606	
0. 603	18. 1	64. 2	2. 64	2	383	
1881. 512	17. 2	61. 0	2. 67	2	383	
1. 522	17. 6	62. 3	2. 40	3	606	
1. 531	16. 5	60. 6	2. 46	2	383	
1. 536	17. 4	60. 2	2. 46	2	606	
1. 588	17. 7	59. 2	2. 49	2	606	
1882. 519	17. 3	53. 4	2. 25	2	606	
2. 538	17. 5	57. 9	2. 29	2	383	
2. 560	16. 6	56. 5	2. 45	2	383	
2. 566	17. 5	57. 2	2. 29	3	383	
2. 571	17. 9	57. 5	2. 32	3	383	
2. 609	18. 0	56. 8	2. 26	2	383	
2. 648	17. 6	53. 8	2. 30	2	383	
1883. 573	17. 7	49. 1	2. 40	3	383	
3. 581	17. 4	47. 7	2. 19	3	383	
3. 592	17. 5	46. 5	2. 45	2	383	
3. 598	17. 3	47. 5	2. 37	3	383	
3. 601	17. 0	48. 6	2. 21	2	383	
3. 603	17. 3	48. 2	2. 16	3	383	
3. 612	17. 0	46. 8	2. 20	3	383	
3. 628	16. 8	47. 8	2. 18	3	383	

70 Ophiuchi = Σ 2272—Continued. $\alpha = 17^h 59^m.4$ $\delta = 2^\circ 33'$ (5 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$'$			
1884. 548	17. 6	38. 7	2. 20	2	383	Cloudy.
4. 581	17. 8	37. 9	2. 23	3	383	
4. 597	17. 5	36. 7	2. 00	3	606	
4. 600	17. 4	37. 7	2. 13	2	606	Clouds.
4. 605	17. 3	37. 5	2. 16	2	606	Clouds.
4. 614	17. 8	37. 2	2. 26	2	606	
4. 616	17. 6	37. 5	2. 18	2	606	
1885. 553	16. 2	29. 0	1. 93	3	606	
5. 561	16. 2	28. 6	1. 93	3	606	
5. 564	16. 7	28. 2	1. 87	3	606	
5. 566	16. 6	29. 2	1. 95	2	606	
5. 575	16. 7	30. 5	1. 81	3	606	
5. 580	16. 2	31. 0	1. 79	3	606	
5. 599	16. 2	30. 3	1. 88	3	606	
1886. 516	17. 2	14. 4	1. 94	2	606	
6. 522	17. 4	14. 2	2. 05	2	383	
6. 525	16. 8	14. 6	1. 96	2	606	
6. 530	17. 2	12. 3	2. 01	2	383	
6. 541	17. 4	14. 0	1. 98	2	383	
6. 544	17. 2	14. 3	1. 94	2	383	
6. 552	16. 8	12. 6	2. 02	2	606	
1887. 565	17. 6	2. 4	1. 89	3	606	
7. 590	16. 6	4. 7	1. 98	3	383	
7. 595	17. 0	4. 9	1. 93	3	606	
7. 625	17. 6	4. 2	1. 92	3	383	
7. 634	17. 1	3. 0	1. 82	2	383	
7. 680	17. 9	2. 3	1. 98	2	383	
1888. 545	17. 5	352. 3	2. 11	2	383	
8. 556	17. 1	353. 8	2. 00	3	606	
8. 562	17. 3	353. 3	2. 05	2	383	
8. 570	17. 4	353. 7	1. 95	3	383	
8. 586	16. 9	352. 7	2. 03	2	606	
8. 589	17. 4	354. 9	1. 98	3	606	
1889. 515	16. 2	344. 9	2. 07	2	383	
9. 526	16. 3	344. 7	2. 16	3	383	
9. 567	17. 3	344. 5	2. 10	3	606	
9. 605	16. 7	345. 6	2. 03	3	383	
9. 616	17. 6	343. 1	2. 12	2	606	
9. 630	16. 7	344. 3	2. 10	3	383	
1890. 498	15. 9	336. 6	2. 08	2	606	
0. 536	16. 7	336. 6	2. 10	2	606	
0. 539	17. 5	335. 8	2. 02	3	606	
0. 542	16. 8	337. 4	2. 10	2	606	
0. 577	17. 3	335. 5	2. 32	2	606	
0. 580	16. 8	335. 1	2. 08	2	383	
0. 626	17. 0	333. 7	2. 24	3	383	

70 Ophiuchi = Σ 2272—Continued.

$$a = 17^h 59^m.4 \quad \delta = 2^\circ 33' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1891. 541	17.0	326.3	2.10	2	606	Hazy.
1. 555	16.4	327.3	2.37	2	606	
1. 557	16.7	327.4	2.16	2	606	Windy.
1. 571	16.5	328.0	2.35	2	606	
1. 577	17.2	328.1	2.22	2	606	Misty.
1. 582	16.9	328.2	2.17	2	606	Hazy.
1880. 576		65.47	2.747			
1881. 536		60.66	2.496			
1882. 573		56.16	2.309			
1883. 599		47.78	2.270			
1884. 594		37.60	2.166			
1885. 571		29.54	1.880			
1886. 533		13.77	1.986			
1887. 615		3.58	1.920			
1888. 568		353.45	2.020			
1889. 576		344.52	2.097			
1890. 557		335.81	2.134			
1891. 564		327.55	2.228			
A period of 95 years. The apparent distance varies from 1'.7 to 6''.7. The observations appear to be sufficient to give a good determination of the orbit.						
70 Ophiuchi (a). (5 and 13.)						
1882. 787	20.1	47.38	92.51	2	383	Very unsteady, blazing; (a) and (b) are the stars observed in 1878, and have been reobserved because some astronomers doubted their existence.
2. 790	20.0	47.62	92.18	3	383	
1886. 516	17.5	45.05	93.60	2	383	16th magnitude.
6. 522	17.6	45.05	93.57	2	383	Clouds.
6. 525	17.1	44.90	93.41	2	383	
1882. 788		47.50	92.397			$\Delta p = 0^{\circ}.00$; $\Delta s = +0''.052$.
1886. 521		45.00	93.558			$\Delta p = 0^{\circ}.00$; $\Delta s = +0''.031$.
70 Ophiuchi (b). (5 and 13.)						
1882. 787	20.0	197.88	65.92	2	338	Very unsteady.
2. 790	20.2	197.80	65.21	2	383	
1886. 522	17.8	200.40	62.37	2	383	14th magnitude.
6. 525	17.3	200.32	62.42	2	383	
6. 530	17.4	200.50	62.64	2	383	
1882. 788		197.84	65.60			$\Delta p = 0^{\circ}.00$; $\Delta s = +0''.040$.
1886. 526		200.41	62.50			$\Delta p = 0^{\circ}.00$; $\Delta s = +0''.021$.

70 Ophiuchi (c). (5 and 13.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	′			
1886.516	17.7	223.98	166.02	2	383	13th magnitude.
6.522	18.0	223.98	165.70	3	383	
6.525	17.5	224.00	165.86	2	383	Clouds.
1886.521	$\Delta \rho =$	223.99	165.86			
0.00		+ 0.06				
223.99		165.92				
Σ 2281.						
$\alpha = 18^h 3^m.4 \quad \delta = 3^\circ 58'$ (6 and 7.)						
1884.619	17.6	244.2	0.88	3	606	
4.622	17.5	242.3	0.81	2	606	
4.625	17.5	246.7	0.84	3	606	
1886.544	17.6	246.3	0.73	2	606	
6.555	16.8	249.6	0.74	2	606	Cloudy.
6.560	17.0	241.9	0.74	2	606	
6.563	16.6	243.9	0.72	2	606	
1884.622		244.40	0.843			
1886.555		245.42	0.732			A slow motion.
Σ 2286.						
$\alpha = 18^h 4^m.3 \quad \delta = 0^\circ 31'$ (8 and 10.)						
1888.647	17.5	316.5	2.60	3	383	
8.649	17.7	316.4	2.60	2	606	Hazy.
8.652	17.7	318.2	2.52	3	383	
1888.649		317.03	2.573			Perhaps motion in angle.
Σ 2289.						
$\alpha = 18^h 4^m.6 \quad \delta = 16^\circ 27'$ (6 and 7.)						
1884.597	18.0	232.7	1.15	2	606	
4.614	18.6	231.9	1.04	2	606	
4.616	17.8	232.9	0.99	2	606	
1884.609		232.50	1.060			Perhaps a slow motion in angle.

Σ 2303.

$a = 18^h\ 13^m.6 \quad \delta = -8^\circ\ 3' \quad (7 \text{ and } 9.)$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power	Remarks.
	h.	°	''			
1887. 590	17. 6	223. 3	2. 84	3	383	Cloudy.
7. 595	17. 2	223. 2	3. 00	3	606	
7. 625	18. 1	223. 5	2. 89	2	383	
1887. 603		223. 33	2. 910			Perhaps motion in angle.

η Serpentis.

$a = 18^h\ 15^m.1 \quad \delta = -2^\circ\ 55' \quad (3 \text{ and } 12.)$

1889. 683	18. 2	66. 38	149. 74	3	383	Probably a case of proper motion.
6. 686	18. 2	66. 15	149. 92	3	383	
1886. 685	$\Delta \rho =$	66. 265	149. 830			
		— 0. 005	+ 0. 047			
		66. 260	149. 877			

Σ 2306. *A* and *B*.

$a = 18^h\ 15^m.4 \quad \delta = -15^\circ\ 9' \quad (7 \text{ and } 8.)$

1884. 638	18. 5	220. 7	12. 33	3	606	Very unsteady. $\left. \begin{array}{l} A \text{ and } \frac{B\ C}{2} \end{array} \right\}$
4. 657	18. 5	221. 4	12. 35	2	606	
1888. 592	17. 8	220. 3	11. 83	3	383	
8. 603	18. 0	220. 3	12. 04	2	383	
1884. 648		221. 05	12. 344			$\Delta s = + 0''.004.$
1888. 598		220. 30	11. 939			

Σ 2306. *B* and *C*.

1884. 638	18. 7	68. 9	1. 04	3	606	Motion doubtful.
4. 657	18. 7	66. 4	1. 00	2	606	
1888. 592	17. 9	67. 0	0. 74	3	606	
8. 603	18. 2	69. 3	0. 82	2	383	
1884. 648		67. 65	1. 020			
1888. 598		68. 15	0. 780			

Σ 2310.

$a = 18^h 15^m.6 \quad \delta = 22^\circ 45' \quad (7 \text{ and } 10.)$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1886.683	h. 18.4	° 235.5	// 5.19	3	383	Motion doubtful.
6.686	18.4	235.6	5.18	3	383	
6.711	18.3	236.7	5.25	3	383	
1886.693		235.93	5.207			

A. C. 11.

$a = 18^h 18^m.7 \quad \delta = -1^\circ 39' \quad (7 \text{ and } 7.)$

1887.595	17.7	178.7	0.28	3	888	
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Σ 2315.

$a = 18^h 20^m.2 \quad \delta = 27^\circ 20' \quad (7 \text{ and } 8.)$

1884.674	18.0	230.0	0.31	3	888	Motion.
4.677	17.9	237.3	0.34	2	888	
1888.592	16.9	222.7	0.28	3	888	
8.603	16.9	221.2	0.30	3	888	
1884.676		233.65	0.325			
1888.598		221.95	0.290			

Σ 2318.

$a = 18^h 20^m.6 \quad \delta = 25^\circ 26' \quad (7 \text{ and } 10.)$

1886.714	18.7	254.7	20.60	3	383	Motion in distance.
6.716	19.2	254.5	20.95	3	383	
1886.715	$\Delta \rho =$	254.60	20.775			
		0.00	+ 0.006			
		254.60	20.781			

$O\Sigma$ 543.

$a = 18^h 22^m.0 \quad \delta = 46^\circ 49' \quad (8 \text{ and } 10.)$

1888.660	17.6	130.4	1.04	2	606	A slow motion in angle.
8.663	17.9	131.1	1.07	2	606	
1888.662		130.75	1.055			

Σ 2323.

$$a = 18^h 22^m.0 \quad \delta = 58^\circ 44' \quad (5 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h	°	"			
1889.605	17.3	357.9	3.70	2	383	
9.616	16.8	358.0	3.62	2	383	
9.627	17.2	359.2	3.56	2	383	
1889.616		358.37	3.627			Perhaps motion in angle.

 $O\Sigma$ 351.

$$a = 18^h 22^m.1 \quad \delta = 48^\circ 41' \quad (7 \text{ and } 7.)$$

1886.714	19.2	28.5	0.63	2	606	
6.716	19.4	26.7	0.58	2	606	
1886.715		27.60	0.605			Motion doubtful.

 $O\Sigma$ 354.

$$a = 18^h 24^m.7 \quad \delta = 6^\circ 40' \quad (7 \text{ and } 8.)$$

1886.574	17.3	163.7	0.82	3	606	
6.577	17.4	164.3	0.80	2	606	
6.588	16.9	167.6	1.30	2	606	Blurred images.
6.612	17.1	163.5	0.91	3	606	
1886.588		164.37	0.909			Perhaps a motion in angle.

 Σ 2330.

$$a = 18^h 25^m.7 \quad \delta = 13^\circ 6' \quad (7 \text{ and } 9.)$$

1886.683	19.2	173.1	19.04	3	383	
6.686	18.7	173.7	18.83	3	383	
6.711	18.7	173.2	18.82	3	383	
1886.693	$\Delta \rho =$	173.33	18.897			
		0.00	+ 0.005			
		173.33	18.902			Diminution of distance.

 Σ 2345.

$$a = 18^h 30^m.4 \quad \delta = 20^\circ 59' \quad (8 \text{ and } 10.)$$

1886.716	20.0	201.0	8.18	3	383	
6.722	18.6	201.3	8.24	2	383	
6.727	18.8	200.6	8.34	3	383	
6.733	18.8	201.1	8.38	2	606	
1886.724		201.00	8.285			Motion.

$\text{O}\Sigma$ 358.

$\alpha = 18^{\text{h}} 30^{\text{m}}.5 \quad \delta = 16^{\circ} 54'$ (6 and 7.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	'			
1884. 619	18. 3	201. 7	1. 85	2	606	
4. 622	18. 1	199. 4	1. 83	3	383	
4. 625	17. 7	201. 0	1. 81	3	606	
1884. 622		200. 70	1. 830			A slow motion in angle.

α Lyrae.

$\alpha = 18^{\text{h}} 32^{\text{m}}.9 \quad \delta = 38^{\circ} 40'$ (1 and 10.)

1881. 536	17. 7	155. 75	48. 93	2	383	
1. 588	17. 9	155. 78	49. 04	2	606	
1. 596	17. 2	155. 65	48. 87	3	383	
1. 616	17. 5	155. 65	48. 82	3	383	
1. 624	17. 5	155. 50	48. 97	2	383	
1. 627	17. 5	155. 80	48. 89	3	383	
1890. 580	17. 1	158. 57	50. 77	3	383	
0. 588	16. 8	158. 65	50. 83	3	383	
0. 594	16. 7	158. 55	50. 48	2	383	
0. 624	17. 4	158. 55	50. 66	3	383	
1881. 598		155. 69	48. 934			
1890. 596		158. 58	50. 699			$\Delta \rho = 0^{\circ} 00$; $\Delta s = + 0''.014$.

α Lyrae. (1 and 14.5.)

1881. 637	19. 2	292. 9	51. 47	2	383	Companion found by G. ANDERSON, July 2, 1881.
	$\Delta \rho =$	0. 0	+ 0. 01			
		292. 9	51. 48			

Σ 2360.

$\alpha = 18^{\text{h}} 34^{\text{m}}.0 \quad \delta = 20^{\circ} 49'$ (8 and 9.)

1886. 555	17. 8	1. 3	2. 49	3	606	
6. 560	17. 7	0. 7	2. 46	2	606	
6. 563	16. 8	1. 0	2. 53	3	606	
1886. 559		1. 00	2. 493			Motion doubtful.

Σ 2369.

$$\alpha = 18^{\text{h}} 37^{\text{m}}.6 \quad \delta = 2^{\circ} 29' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1886.555	18.1	96.6	1.10	3	606	Hazy.
6.560	18.0	94.1	1.02	2	606	
6.563	17.3	95.1	0.98	2	606	
1886.559		95.27	1.033			Diminution of distance.

 Σ 2375.

$$\alpha = 18^{\text{h}} 39^{\text{m}}.6 \quad \delta = 5^{\circ} 23' \quad (7 \text{ and } 8.)$$

1882.538	18.0	113.3	2.46	2	383	Clouds.
2.566	17.7	112.0	2.32	3	383	
2.609	18.3	112.8	2.29	2	383	
2.648	17.9	113.4	2.24	2	383	
1885.714	18.5	115.1	2.15	3	383	
5.717	18.8	114.1	2.25	3	383	
5.720	19.0	114.4	2.20	2	383	
1882.590		112.88	2.328			Perhaps a slow motion in angle.
1885.717		114.53	2.200			

 ϵ_1 Lyrae = Σ 2382.

$$\alpha = 18^{\text{h}} 40^{\text{m}}.4 \quad \delta = 39^{\circ} 33' \quad (5 \text{ and } 6.)$$

1883.581	17.8	14.4	3.12	2	383	Clouds.
3.592	17.7	17.2	3.11	2	383	
3.601	17.5	14.1	3.00	2	383	
1886.555	17.1	17.0	2.98	3	606	
6.560	17.2	17.1	3.00	2	606	
6.563	17.0	16.3	3.03	3	606	
6.574	16.9	16.3	3.08	3	606	
1888.592	17.1	14.7	3.05	3	606	
8.603	17.2	14.4	3.13	3	383	
8.611	17.0	15.6	3.04	3	383	
8.625	17.5	14.5	3.08	3	606	
1883.591		15.23	3.077			A slow motion.
1886.563		16.68	3.022			
1888.608		14.80	3.075			

ϵ_2 **Lyrae** = Σ **2383.**

$\alpha = 18^h\ 40^m.4$ $\delta = 39^\circ\ 29'$ (5 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1883. 581	17. 6	135. 0	2. 29	2	383	
3. 592	17. 8	134. 7	2. 52	2	383	
3. 601	17. 6	135. 0	2. 33	2	383	
1886. 555	17. 3	133. 3	2. 36	3	606	
6. 560	17. 4	132. 8	2. 40	2	606	
6. 563	17. 1	133. 6	2. 32	2	606	
6. 574	17. 0	134. 5	2. 50	3	606	
1888. 592	17. 2	133. 9	2. 34	3	606	
8. 603	17. 3	133. 6	2. 20	3	383	
8. 611	17. 2	133. 0	2. 38	3	383	
8. 625	17. 6	131. 5	2. 29	3	606	
1883. 591		134. 90	2. 380			
1886. 563		133. 55	2. 395			
1888. 608		133. 00	2. 302			A slow motion.

ζ **Lyrae.**

$\alpha = 18^h\ 40^m.6$ $\delta = 37^\circ\ 29'$ (4 and 6.)

1886. 656	18. 3	149. 80	43. 79	3	383	
6. 659	17. 8	149. 52	43. 74	2	383	
6. 667	17. 7	149. 60	43. 61	2	383	Blazing images.
1886. 661	$\Delta p =$	149. 64	43. 713			
		0. 00	+ 0. 012			
		149. 64	43. 725			No motion.

Σ **2396.**

$\alpha = 18^h\ 42^m.9$ $\delta = 10^\circ\ 40'$ (8 and 11.)

1885. 649	17. 6	318. 25	24. 37	2	383	
5. 659	17. 7	318. 2	24. 02	2	383	
5. 673	18. 5	318. 2	24. 47	2	383	
1885. 660	$\Delta p =$	318. 22	24. 287			
		0. 00	+ 0. 008			
		318. 22	24. 295			Motion.

Σ 2398.

$\alpha = 18^h 41^m.6 \quad \delta = 59^\circ 25'$ (8 and 9.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h	°	"			
1889. 542	16. 2	147. 5	16. 95	2	383	
9. 545	16. 0	147. 4	16. 95	3	383	
9. 567	16. 5	147. 2	16. 91	3	383	
1889. 551	$\Delta p =$	147. 37	16. 937			
		0 00	+ 0. 006			
		147. 37	16. 943			Motion.

Anonyma.

$\alpha = 18^h 43^m.0 \quad \delta = 11^\circ 20'$ (9 and 10.)

1885. 553	16. 9	228. 6	1. 39	2	606	
5. 561	16. 7	228. 8	1. 31	2	606	
5. 564	17. 1	229. 9	1. 23	3	606	
1885. 559		229. 10	1. 310			

Σ 2400.

$\alpha = 18^h 43^m.5 \quad \delta = 16^\circ 7'$ (8 and 11.)

1883. 770	19. 9	200. 4	1. 94	2	606	Comp. double; discovered by PERROTIN. Mean of <i>B</i> and <i>C</i> . Telescope shaken. Middle star $\frac{2}{3}$ <i>s</i> from <i>A</i> . Middle star $\frac{2}{3}$ <i>s</i> from <i>A</i> .
3. 773	19. 4	202. 8	2. 27	3	383	
3. 776	19. 3	201. 6	2. 12	2	383	
1884. 616	18. 1	200. 4	2. 25	2	606	
4. 619	18. 1	199. 0	2. 31	3	383	
4. 622	18. 3	198. 3	2. 05	2	383	
1885. 616	18. 9	198. 6	2. 50	3	888	
5. 717	19. 0	197. 5	2. 54	3	606	
5. 736	18. 6	198. 1	2. 38	3	606	
1883. 773		201. 60	2. 110			
1884. 619		199. 23	2. 203			Motion.
1885. 623		198. 07	2. 473			

G. A. 5.

$\alpha = 18^h 44^m.0 \quad \delta = 10^\circ 40'$ (10 and 11.)

1885. 553	17. 1	94. 4	2. 24	2	606	
5. 561	16. 8	93. 4	2. 33	2	606	
5. 564	17. 2	94. 1	2. 27	3	606	
1885. 559		93. 97	2. 280			

Σ 2402.

$$\alpha = 18^{\text{h}} 44^{\text{m}}.1 \quad \delta = 10^{\circ} 32' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1884. 619	h. 18. 5	° 202. 5	′ 1. 06	2	606	
4. 622	18. 6	204. 8	1. 07	2	606	
4. 625	17. 9	207. 1	1. 19	2	606	
1884. 622		204. 80	1. 107			

Probably a slow motion.

 Σ 2404.

$$\alpha = 18^{\text{h}} 45^{\text{m}}.1 \quad \delta = 10^{\circ} 50' \quad (6 \text{ and } 7.)$$

1885. 684	18. 3	184. 3	3. 55	3	383	
5. 701	18. 3	183. 7	3. 56	3	383	
5. 703	18. 9	184. 0	3. 42	2	383	
5. 706	18. 4	183. 9	3. 61	2	383	
1885. 698		183. 98	3. 535			No motion.

Ring Neb. Star.

$$\alpha = 18^{\text{h}} 49^{\text{m}}.1 \quad \delta = 32^{\circ} 52'$$

1886. 626	18. 0	284. 48	366. 85	2	383	Windy; positions referred to star <i>a</i> near following end of nebula.
6. 640	17. 9	284. 50	366. 42	3	383	
1886. 633	$\Delta \rho =$	284. 49	366. 64			
		0. 00	+ 0. 11			
		284. 49	366. 75			

 Σ 2420.

$$\alpha = 18^{\text{h}} 49^{\text{m}}.4 \quad \delta = 59^{\circ} 15' \quad (5 \text{ and } 8.)$$

1889. 542	16. 5	336. 0	31. 48	2	383	Clouds.
9. 545	16. 2	335. 5	31. 35	2	383	
9. 553	15. 7	336. 1	31. 42	2	383	
1889. 547	$\Delta p =$	335. 87	31. 417			Motion.
		+ 0. 02	+ 0. 009			
		335. 89	31. 426			

Σ 2422.

$\alpha = 18^h\ 52^m.3$ $\delta = 25^\circ\ 57'$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	′			
1882. 648	18. 1	96. 5	0. 65	2	606	
2. 757	13. 5	97. 6	0. 63	3	606	
2. 760	19. 3	97. 8	0. 71	3	606	
1883. 581	18. 2	96. 0	0. 82	2	606	
3. 612	17. 3	99. 1	0. 79	3	383	
3. 628	17. 2	100. 9	0. 80	3	606	
3. 650	18. 2	95. 5	0. 78	2	606	
1886. 574	18. 1	96. 2	0. 88	3	606	
6. 577	17. 7	95. 0	0. 89	2	606	
6. 610	18. 5	96. 3	0. 70	3	606	
1882. 722		97. 30	0. 663			
1883. 618		97. 88	0. 798			
1886. 587		95. 83	0. 823			Perhaps a slow motion.

Σ 3130.

$\alpha = 18^h\ 52^m.3$ $\delta = 44^\circ\ 4'$

1884. 674	18. 3	259. 1	2. 68	2	606	
4. 677	18. 1	266. 7	2. 76	3	606	
1886. 563	18. 0	263. 7	2. 75	2	606	
6. 574	17. 7	262. 9	2. 76	3	606	
1884. 676		267. 90	2. 720			
1886. 568		263. 30	2. 755			Probably motion.

ζ Sagittarii.

$\alpha = 18^h\ 55^m.0$ $\delta = -30^\circ\ 3'$ (3 and 5.)

1886. 574	18. 3	269. 6	0. 71	2	606	Images always blurred.
6. 577	18. 7	276. 6	0. 66	2	606	Images always blurred.
6. 607	18. 4	274. 3	0. 58	2	606	Images always blurred.
6. 711	18. 0	264. 9	0. 67	3	606	Images always blurred.
1886. 617		271. 35	0. 655			

Σ 2434. *A* and *B*.

$$\alpha = 18^{\text{h}} 56^{\text{m}}.6 \quad \delta = -0^{\circ} 53' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1884. 622	18. 9	129. 8	23. 72	2	606	
4. 625	18. 4	130. 4	23. 80	2	606	
4. 633	18. 9	129. 4	24. 06	3	606	
1885. 649	18. 1	129. 35	23. 80	2	383	
5. 659	18. 1	129. 8	23. 70	2	383	
5. 673	19. 0	129. 7	23. 83	2	383	
1884. 627		129. 87	23. 868			$\Delta \rho = 0^{\circ}.00 : \Delta \rho = + 0''.008.$
1885. 660		129. 62	23. 785			Motion.

 Σ 2434. *B* and *C*. (8 and 12.)

1884. 622	19. 0	65. 1	1. 51	2	606	
4. 625	18. 5	65. 2	1. 59	2	606	Faint.
4. 635	17. 8	64. 4	1. 56	3	606	
1885. 649	18. 3	66. 9	1. 53	2	606	
5. 659	18. 3	65. 3	1. 65	2	383	
5. 684	18. 6	64. 8	1. 59	3	383	
1884. 627		64. 90	1. 553			
1885. 664		65. 67	1. 590			

 Σ 2437.

$$\alpha = 18^{\text{h}} 56^{\text{m}}.6 \quad \delta = 19^{\circ} 0' \quad (8 \text{ and } 8.)$$

1884. 622	19. 4	66. 1	1. 02	2	606	
4. 625	18. 1	65. 3	0. 82	3	606	
4. 633	18. 6	65. 6	0. 84	3	606	
1884. 627		65. 67	0. 893			Motion in angle.

 Σ 2441.

$$\alpha = 18^{\text{h}} 57^{\text{m}}.7 \quad \delta = 31^{\circ} 16' \quad (8 \text{ and } 9.)$$

1884. 663	18. 3	281. 1	5. 49	3	606	Windy.
4. 671	18. 2	281. 7	5. 38	2	383	
4. 674	18. 6	281. 1	5. 60	3	383	
1884. 679		281. 30	5. 490			Motion in angle.

ζ Aquilæ.

$$\alpha = 18^{\text{h}} 59^{\text{m}}.0 \quad \delta = 13^{\circ} 40' \quad (3 \text{ and } 15.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1885. 659	17. 9	61. 4	5. 57	2	383	
5. 701	18. 6	63. 5	5. 71	3	383	
1885. 680		62. 45	5. 640			

Σ 2454.

$$\alpha = 19^{\text{h}} 1^{\text{m}}.5 \quad \delta = 30^{\circ} 15' \quad (8 \text{ and } 9.)$$

1884. 663	18. 6	233. 6	0. 79	2	606	
4. 677	18. 3	233. 7	0. 76	2	383	
4. 679	18. 2	234. 1	0. 72	3	606	
1884. 673		233. 80	0. 757			Perhaps a motion in angle.

Σ 2456.

$$\alpha = 19^{\text{h}} 1^{\text{m}}.6 \quad \delta = 38^{\circ} 20'$$

1888. 589	17. 8	6. 1	24. 76	3	383	Clouds.
8. 592	18. 1	6. 1	24. 89	3	383	
1888. 590	$\Delta p =$	6. 10	24. 825			
		0. 00	+ 0. 007			
		6. 10	24. 832			Diminution of distance.

Σ 2455.

$$\alpha = 19^{\text{h}} 1^{\text{m}}.8 \quad \delta = 21^{\circ} 59' \quad (7 \text{ and } 8.)$$

1884. 614	18. 9	96. 4	3. 42	2	606	
4. 616	18. 3	97. 6	3. 55	2	606	
4. 619	18. 8	98. 5	3. 39	2	383	
1884. 616		97. 50	3. 453			Motion in angle.

Σ 2481.

$$\alpha = 19^{\text{h}} 7^{\text{m}}.1 \quad \delta = 38^{\circ} 36' \quad (8 \text{ and } 8.)$$

1885. 659	18. 7	223. 9	4. 18	2	383	
5. 701	18. 8	224. 2	4. 16	3	383	
1885. 680		224. 05	4. 170			Perhaps a slow motion in angle.

Σ 2486.

$$\alpha = 19^{\text{h}} 9^{\text{m}}.0 \quad \delta = 49^{\circ} 37' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1885. 717	18. 6	220. 9	9. 72	3	383	6 B Cygni.
5. 720	18. 8	220. 0	9. 58	2	606	
1886. 560	18. 3	219. 6	9. 65	3	383	
6. 563	17. 6	220. 0	9. 97	3	383	
6. 574	17. 9	220. 1	9. 81	2	606	
6. 577	18. 0	220. 3	9. 78	2	606	
1885. 718		220. 45	9. 650			Motion doubtful.
1886. 568		220. 00	9. 802			

 $O\Sigma$ 371.

$$\alpha = 19^{\text{h}} 9^{\text{m}}.9 \quad \delta = 27^{\circ} 11' \quad (7 \text{ and } 7.)$$

1886. 593	17. 8	153. 3	0. 82	2	383	
6. 607	17. 3	153. 8	0. 79	3	606	
6. 610	18. 3	154. 8	0. 77	3	606	
1886. 603		153. 97	0. 793			

Motion doubtful.

 Σ 2488.

$$\alpha = 19^{\text{h}} 10^{\text{m}}.3 \quad \delta = 19^{\circ} 49' \quad (9 \text{ and } 10.)$$

1888. 603	18. 5	329. 9	1. 39	3	383	
8. 611	17. 8	329. 3	1. 47	2	383	
1888. 607		329. 60	1. 430			

A slow motion in angle.

 $O\Sigma$ 368.

$$\alpha = 19^{\text{h}} 10^{\text{m}}.6 \quad \delta = 15^{\circ} 57' \quad (8 \text{ and } 9.)$$

1884. 614	19. 2	209. 9	0. 84	2	606	
4. 616	18. 5	214. 1	0. 82	2	606	
4. 619	19. 0	212. 7	1. 06	2	606	
1884. 616		212. 23	0. 907			

Motion doubtful.

 Σ 2509.

$$\alpha = 19^{\text{h}} 15^{\text{m}}.6 \quad \delta = 62^{\circ} 59' \quad (7 \text{ and } 8.)$$

1889. 567	16. 8	337. 7	0. 93	3	606	
9. 572	17. 2	337. 7	0. 93	2	606	
9. 616	17. 1	339. 2	0. 93	2	606	
1889. 585		338. 20	0. 930			

A slow motion in angle.

Σ 2514.

$a = 19^h\ 16^m.8 \quad \delta = 67^\circ\ 28'$ (9 and 10.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1889. 630	h. 17. 6	° 321. 0	// 9. 66	3	383	Cloudy.
9. 635	17. 7	321. 2	9. 75	3	383	Faint; a hazy sky.
1889. 633		321. 10	9. 705			Motion.

Anonyma.

$a = 19^h\ 17^m.5 \quad \delta = -29^\circ\ 32'$ (6 and 10.)

1889. 668	18. 6	170. 0	16. 23	2	383	
9. 674	19. 0	168. 7	16. 31	2	383	
1889. 671		169. 35	16. 270			
	$\Delta \rho =$	+ 0. 01	+ 0. 034			
		169. 36	16. 304			

Σ 2515.

$a = 19^h\ 19^m.4 \quad \delta = 21^\circ\ 17'$ (8 and 9.)

1888. 603	18. 8	26. 3	11. 86	3	383	
8. 611	18. 1	26. 0	11. 91	3	383	
1888. 607		26. 15	11. 885			
	$\Delta \rho =$	0. 00	+ 0. 003			
		26. 15	11. 888			Motion.

Σ 2524.

$a = 19^h\ 21^m.6 \quad \delta = 25^\circ\ 15'$ (8 and 9.)

1888. 611	18. 4	100. 0	6. 80	3	383	
8. 625	17. 9	100. 3	6. 87	3	383	Clouds.
1888. 618		100. 15	6. 835			Perhaps a motion in angle.

Σ 2525.

$a = 19^h\ 21^m.7 \quad \delta = 27^\circ\ 8'$ (7 and 8.)

1886. 574	18. 6	212. 5	. .	2	888	Not separated; observation doubtful.
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β Cygni.

$$\alpha = 19^{\text{h}} 25^{\text{m}}.8 \quad \delta = 27^{\circ} 47' \quad (3 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1883. 612	18. 8	55. 28	34. 55	3	383	
3. 628	17. 5	55. 30	34. 52	2	383	
1884. 614	19. 4	54. 9	34. 52	2	383	
4. 616	18. 8	54. 9	34. 61	2	606	
4. 619	19. 3	55. 1	34. 54	2	383	
1886. 593	18. 2	54. 90	34. 54	2	383	
6. 607	17. 6	55. 05	34. 68	3	383	
6. 610	18. 0	55. 08	34. 54	3	383	
1883. 620		55. 29	34. 545			$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.010.$
1884. 616		54. 97	34. 567			
1886. 603		55. 01	34. 597			No motion.
Σ 2536.						
$\alpha = 19^{\text{h}} 26^{\text{m}}.3 \quad \delta = 17^{\circ} 32' \quad (8 \text{ and } 11.)$						
1888. 625	18. 3	67. 6	1. 84	3	383	
8. 647	17. 9	66. 6	1. 95	2	383	Faint; hazy.
8. 649	18. 3	66. 9	1. 92	3	383	
1888. 640		67. 03	1. 903			Motion in angle.
$O\Sigma$ 375.						
$\alpha = 19^{\text{h}} 29^{\text{m}}.3 \quad \delta = 17^{\circ} 51' \quad (8 \text{ and } 9.)$						
1888. 625	18. 5	148. 3	0. 49	3	606	
8. 649	18. 6	149. 0	0. 54	2	606	
8. 652	17. 9	142. 7	0. 50	3	606	
1888. 642		146. 67	0. 510			Motion in angle.
Σ 2541.						
$\alpha = 19^{\text{h}} 30^{\text{m}}.2 \quad \delta = - 10^{\circ} 42' \quad (8 \text{ and } 10.)$						
1884. 671	19. 2	327. 0	3. 94	2	383	
4. 674	18. 9	326. 5	3. 73	2	383	
4. 677	18. 6	328. 9	3. 93	2	383	
1884. 674		327. 47	3. 867			Motion in angle.

Σ 2544. A and B .

$$\alpha = 19^{\text{h}} 31^{\text{m}}.3 \quad \delta = 8^{\circ} 2' \quad (8 \text{ and } 10.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1884. 674	19. 2	209. 1	0. 97	2	606	
4. 677	19. 1	206. 6	1. 15	3	606	
4. 679	18. 9	208. 1	1. 13	2	383	
1886. 640	18. 2	212. 5	0. 84	2	606	
6. 651	18. 6	205. 8	1. 03	3	606	
6. 653	18. 4	207. 8	1. 06	2	606	
1884. 677		207. 93	1. 083			
1886. 648		208. 70	0. 977			Motion doubtful.

 Σ 2544. $\frac{AB}{2}$ and C .

1884. 677	19. 2	239. 1	15. 17	3	606	
4. 679	19. 1	238. 9	15. 25	2	383	
1884. 678		239. 00	15. 210			
	$\Delta p =$	0. 00	+ 0. 006			
		239. 00	15. 216			

 Σ 2544. A and C . (8 and 9.)

1884. 674	19. 4	239. 0	15. 77	2	606	
1886. 640	18. 4	238. 4	15. 59	2	606	
6. 651	18. 8	238. 3	15. 82	3	606	
6. 653	18. 6	238. 6	15. 79	3	606	
1886. 154		238. 58	15. 742			
	$\Delta p =$	0. 00	+ 0. 006			
		238. 58	15. 748			

 Σ 2553.

$$\alpha = 19^{\text{h}} 31^{\text{m}}.8 \quad \delta = 61^{\circ} 47' \quad (8 \text{ and } 9.)$$

1889. 630	17. 8	96. 0	0. 83	2	606	
9. 635	17. 4	94. 8	0. 79	3	606	
9. 641	17. 5	96. c	0. 86	3	606	
1889. 635		95. 60	0. 827			Motion in angle.

Σ 2545. *A* and *B*.

$$\alpha = 19^{\text{h}} 32^{\text{m}}.1 \quad \delta = -10^{\circ} 26' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1886.683	h. 19.8	° 315.6	// 3.44	2	383	No motion.
6.711	18.9	316.7	3.69	3	383	
6.714	19.2	316.8	3.74	3	383	
1886.703		316.37	3.623			

 Σ 2545. *A* and *C*.

1886.683	20.0	168.6	28.01	2	383	
6.711	19.1	168.8	27.70	3	383	
6.714	19.6	169.1	28.20	3	383	
1886.703	$\Delta \rho =$	168.83	27.970			
		0.00	+ 0.014			
		168.83	27.984			

 Σ 2556.

$$\alpha = 19^{\text{h}} 34^{\text{m}}.4 \quad \delta = 21^{\circ} 56' \quad (7 \text{ and } 8.)$$

1884.625	18.9	164.7	0.59	2	606	Motion in angle.
4.635	18.5	156.7	0.71	2	606	
4.638	19.1	160.6	0.49	3	606	
1884.633		160.67	0.597			

***O* Σ 380.**

$$\alpha = 19^{\text{h}} 36^{\text{m}}.9 \quad \delta = 11^{\circ} 33' \quad (6 \text{ and } 7.)$$

1884.638	19.3	80.1	0.53	3	606	No motion.
4.657	19.2	75.6	0.49	2	606	
4.663	18.8	75.2	0.60	2	606	
1884.653		76.97	0.540			

Anonyma.

$$\alpha = 19^{\text{h}} 38^{\text{m}}.7 \quad \delta = 50^{\circ} 15' \quad (6 \text{ and } 7.)$$

1886.593	18.6	134.88	38.06	2	383	Cloudy.
6.607	18.0	135.28	38.23	3	383	
6.610	17.8	135.28	38.09	3	383	
1886.603	$\Delta \rho =$	135.15	38.127			
		+ 0.01	+ 0.011			
		135.16	38.138			

Σ 2574. $\alpha = 19^h 39^m.1$ $\delta = 62^\circ 23'$ (8 and 9.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	//			
1889. 641	17. 7	326. 1	0. 55	3	606	
9. 649	18. 6	143. 3	0. 49	3	606	
9. 663	18. 5	326. 4	0. 62	3	606	
1889. 651		325. 27	0. 553			Motion in angle.

 Σ 2576. $\alpha = 19^h 40^m.8$ $\delta = 33^\circ 20'$ (8 and 8.)

1882. 648	18. 5	122. 9	3. 17	3	383	
2. 757	20. 1	120. 6	3. 04	3	606	
2. 760	20. 3	120. 9	2. 96	2	606	
1884. 677	18. 8	122. 2	3. 03	3	606	
4. 679	19. 3	118. 9	3. 01	2	383	
4. 682	18. 5	120. 9	3. 04	2	383	
1882. 722		121. 47	3. 057			
1884. 679		120. 67	3. 027			Motion in angle.

 δ Cygni = Σ 2579. $\alpha = 19^h 41^m.2$ $\delta = 44^\circ 50'$ (3 and 8.)

1880. 603	18. 4	331. 0	1. 66	2	606	
0. 734	19. 2	330. 3	1. 56	3	606	
0. 753	18. 4	331. 7	1. 47	2	606	
1881. 588	18. 6	329. 3	1. 58	2	606	
1. 591	18. 4	330. 6	1. 83	2	383	Distance poor.
1. 596	18. 4	327. 8	1. 60	2	606	
1882. 648	18. 8	328. 7	1. 66	2	606	
2. 757	20. 4	328. 8	1. 37	2	606	
2. 760	20. 5	327. 1	1. 58	2	606	
1883. 612	18. 2	327. 9	1. 73	3	383	
3. 628	18. 1	324. 7	1. 48	3	606	
3. 658	18. 0	325. 3	1. 46	2	606	
3. 770	20. 2	326. 7	1. 68	2	606	
3. 773	20. 5	325. 9	1. 54	2	383	
1884. 663	19. 1	322. 9	1. 67	2	606	
4. 679	18. 5	327. 2	1. 59	2	383	
4. 685	18. 2	327. 0	1. 68	3	383	
4. 690	18. 3	327. 1	1. 50	3	383	
1885. 720	18. 6	321. 8	1. 45	3	606	
5. 736	18. 8	322. 9	1. 43	3	606	
5. 739	18. 4	323. 0	1. 47	2	606	
5. 744	18. 7	323. 2	1. 50	3	606	

δ Cygni = Σ 2579—Continued $\alpha = 19^{\text{h}} 41^{\text{m}}.2$ $\delta = 44^{\circ} 50'$ (3 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	"			
1886. 653	18. 2	323. 4	1. 41	3	606	
6. 673	17. 9	324. 5	1. 51	2	606	
6. 675	17. 5	325. 6	1. 43	3	606	
1888. 701	18. 5	318. 0	1. 35	2	606	
8. 707	18. 1	317. 5	1. 36	2	606	
8. 759	19. 0	316. 7	1. 58	2	383	
8. 762	18. 9	320. 3	1. 53	2	383	
1889. 526	16. 7	310. 9	1. 60	2	606	
9. 567	17. 0	312. 0	1. 49	2	606	
9. 616	17. 3	316. 7	1. 31	2	606	
9. 649	17. 8	310. 2	1. 53	3	606	
1890. 536	16. 9	307. 4	1. 49	2	606	
0. 539	17. 7	311. 3	1. 57	3	606	Faint.
0. 555	16. 8	312. 7	1. 47	2	606	
0. 662	17. 3	309. 0	1. 55	2	606	
1880. 697		331. 00	1. 563			
1881. 592		329. 23	1. 638			
1882. 722		328. 20	1. 537			
1883. 688		326. 10	1. 578			
1884. 679		326. 05	1. 610			
1885. 735		322. 72	1. 462			
1886. 667		324. 50	1. 450			
1888. 732		318. 12	1. 455			
1889. 589		312. 45	1. 482			
1890. 573		310. 10	1. 520			Probably a binary of long period.

 $O\Sigma$ 387. $\alpha = 19^{\text{h}} 44^{\text{m}}.3$ $\delta = 35^{\circ} 0'$ (7.5 and 8.)

1881. 588	18. 8	189. 0	.	2	888	
1. 616	18. 4	192. 6	0. 50	3	888	
1. 627	18. 0	190. 3	0. 55	3	888	
1882. 648	19. 0	190. 5	0. 35	2	888	
2. 757	20. 6	192. 2	0. 53	3	606	
1883. 612	18. 4	188. 5	0. 57	3	606	
3. 628	17. 8	191. 6	0. 50	3	606	Small star certainly north.
3. 650	18. 6	186. 6	0. 55	2	606	
1884. 685	18. 5	186. 9	0. 50	3	606	
4. 690	18. 7	188. 2	0. 60	3	606	
4. 696	18. 8	183. 2	0. 58	2	606	All angles should be diminished by 1Sc° .

OΣ 387—Continued.

$\alpha = 19^{\text{h}} 44^{\text{m}}.3$ $\delta = 35^{\circ} 0'$ (7.5 and 8.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	°	"			
1885. 736	19. 1	359. 7	0. 51	4	606	
5. 739	18. 6	6. 2	0. 57	2	606	
5. 744	18. 9	4. 3	0. 50	3	606	
5. 747	18. 7	3. 7	0. 52	3	606	
1886. 607	18. 2	5. 6	0. 50	3	600	
6. 610	18. 7	3. 2	0. 58	3	606	Clouds.
6. 634	18. 2	4. 1	0. 52	2	888	
6. 640	18. 7	5. 8	0. 54	2	888	
1888. 701	18. 8	357. 9	0. 53	2	606	
8. 707	18. 3	359. 4	0. 55	2	606	
8. 759	19. 2	353. 0	0. 54	2	383	
8. 762	19. 1	354. 7	0. 54	2	383	
1889. 567	17. 7	356. 7	0. 48	3	606	
9. 649	18. 4	0. 0	0. 50	3	606	
9. 663	18. 8	359. 6	0. 60	3	606	
9. 665	18. 1	356. 7	0. 55	3	888	
1890. 536	17. 1	359. 4	0. 55	2	606	
0. 662	18. 0	354. 7	0. 60	2	606	
0. 665	17. 9	353. 5	0. 59	2	606	
1881. 610		10. 63	0. 525			
1882. 702		11. 35	0. 440			
1883. 630		8. 90	0. 540			
1884. 690		6. 10	0. 560			
1885. 742		3. 48	0. 525			
1886. 623		4. 68	0. 535			
1888. 732		356. 25	0. 540			
1889. 661		358. 25	0. 532			
1890. 621		355. 87	0. 580			A period of about 100 years.

B. A. C. 6814.

$\alpha = 19^{\text{h}} 47^{\text{m}}.1$ $\delta = -24^{\circ} 13'$ (6 and 10.)

1886. 634	18. 9	129. 0	16. 39	3	383	
6. 637	19. 8	129. 4	16. 53	2	383	
6. 651	19. 2	129. 3	16. 91	2	383	Clouds.
1886. 641		129. 23	16. 610			
	$\Delta\rho =$	+ 0. 02	+ 0. 014			
		129. 25	16. 624			

Σ 2603.

$a = 19^h 48^m.6 \quad \delta = 69^\circ 58'$ (5 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1889. 641	18. 0	3. 9	3. 07	2	606	
9. 668	17. 8	4. 3	3. 06	3	383	
9. 674	17. 9	5. 1	2. 98	3	383	
9. 682	17. 9	4. 3	2. 96	3	383	
1889. 666		4. 40	3. 018			Motion in angle.

β Aquilæ = $O\Sigma$ 532.

$a = 19^h 49^m.4 \quad \delta = 6^\circ 6'$ (3 and 12.)

1884. 625	19. 4	15. 7	12. 20	3	383	
4. 635	19. 0	16. 1	11. 98	2	383	
1884. 630		15. 90	12. 090			

A. C. 16.

$a = 19^h 52^m.9 \quad \delta = 26^\circ 56'$ (7 and 9.)

1888. 625	18. 7	232. 7	0. 44	3	606	
8. 652	18. 1	235. 5	0. 46	3	606	
8. 663	18. 3	59. 0	0. 48	3	606	The right quadrant.
1888. 647		55. 73	0. 460			

Σ 2607. A and B.

$a = 19^h 53^m.7 \quad \delta = 41^\circ 57'$ (7 and 9.)

1884. 698	18. 8	321. 5	0. 34	2	888	
1889. 649	19. 2	307. 9	0. 41	3	888	Clouds.
9. 665	18. 3	303. 9	0. 32	3	888	
1884. 698		321. 5	0. 34			
1889. 657		305. 90	0. 365			Motion doubtful.

Σ 2607. $\frac{AB}{2}$ and C. (7 and 9.)

1884. 696	19. 1	292. 8	3. 16	2	606	
4. 698	18. 6	293. 4	3. 25	2	606	
4. 704	18. 3	291. 5	3. 20	2	606	
1889. 616	18. 5	289. 9	3. 21	2	383	Clouds.
9. 649	19. 6	291. 8	3. 10	3	606	
9. 665	18. 5	290. 5	3. 13	3	606	
1884. 699		292. 57	3. 237			
1889. 643		290. 73	3. 147			

OΣ 395.

$a = 19^h 56^m.9 \quad \delta = 24^\circ 36'$ (6 and 7.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1888. 625	18. 9	100. 3	0. 50	3	606	
8. 652	18. 3	99. 4	0. 63	2	606	
8. 663	18. 5	100. 9	0. 67	3	606	
1888. 647		100. 20	0. 600			Perhaps a slow motion in angle.

Σ 2640.

$a = 20^h 3^m.2 \quad \delta = 63^\circ 32'$ (7 and 11.)

1889. 641	18. 3	23. 0	5. 35	3	383	
9. 649	18. 8	21. 6	5. 41	3	606	
9. 663	19. 0	21. 4	5. 23	3	383	
1889. 651		22. 00	5. 33 ⁰			Possibly motion.

Σ 2642.

$a = 20^h 4^m.0 \quad \delta = 63^\circ 20'$ (9 and 9.)

1889. 641	18. 5	169. 8	2. 04	3	383	
9. 649	19. 0	172. 3	2. 15	3	606	
9. 663	19. 2	170. 9	2. 20	3	383	
1889. 651		171. 00	2. 13 ⁰			Possibly motion

θ Sagittæ.

$a = 20^h 4^m.6 \quad \delta = 20^\circ 33'$ (6 and 8.)

1886. 653	18. 9	326. 6	11. 52	3	383	
6. 656	18. 6	327. 0	11. 48	3	383	
6. 659	18. 1	327. 25	11. 66	2	383	
1886. 656	$\Delta \rho =$	326. 95	11. 553			
		0. 00	+ 0. 003			
		326. 95	11. 556			

Σ 2646.

$a = 20^h 8^m.0 \quad \delta = -6^\circ 25'$

1887. 874	22. 0	48. 6	22. 46	2	383	
7. 877	21. 3	48. 7	22. 49	3	383	
1887. 876	$\Delta \rho =$	48. 65	22. 475			
		0. 00	+ 0. 008			
		48. 65	22. 483			Diminution of distance.

Σ 2658.

$$\alpha = 20^{\text{h}} 10^{\text{m}}.5 \quad \delta = 52^{\circ} 45' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889. 665	h. 18. 8	° 118. 0	// 5. 45	3	606	
9. 668	18. 1	119. 5	5. 59	3	383	
9. 674	18. 1	118. 6	5. 46	2	383	
1889. 669		118. 70	5. 500			

Perhaps a motion.

 α^2 Capricorni. B and C .

$$\alpha = 20^{\text{h}} 11^{\text{m}}.4 \quad \delta = -12^{\circ} 55' \quad (12 \text{ and } 13.)$$

1886. 735	19. 7	239. 7	1. 30	2	383	Faint. Cloudy.
6. 741	20. 4	242. 7	1. 21	2	383	
1886. 738		241. 20	1. 255			

 Σ 2666.

$$\alpha = 20^{\text{h}} 13^{\text{m}}.9 \quad \delta = 40^{\circ} 21' \quad (7 \text{ and } 9.)$$

1888. 625	19. 1	243. 9	2. 66	3	606	
8. 647	18. 1	245. 2	2. 69	2	383	
8. 649	18. 8	245. 1	2. 57	2	383	
1888. 640		244. 73	2. 640			

Motion doubtful.

 $O\Sigma$ 406.

$$\alpha = 20^{\text{h}} 16^{\text{m}}.2 \quad \delta = 45^{\circ} 0' \quad (7 \text{ and } 8.)$$

1884. 709	18. 9	111. 5	0. 56	2	606	
4. 712	19. 0	103. 4	0. 63	2	606	
4. 778	19. 7	108. 4	0. 53	3	606	
1886. 653	19. 2	108. 5	0. 47	3	888	
6. 673	18. 2	107. 1	0. 45	2	888	
6. 675	18. 3	107. 1	0. 42	3	888	
1884. 733		107. 77	0. 573			
1886. 667		107. 57	0. 447			

Motion in angle.

 Σ 2673.

$$\alpha = 20^{\text{h}} 17^{\text{m}}.1 \quad \delta = 12^{\circ} 57' \quad (8 \text{ and } 10.)$$

1884. 614	19. 8	330. 6	2. 56	3	383	
4. 616	19. 4	331. 8	2. 59	3	383	
4. 619	19. 5	331. 6	2. 53	3	383	
1884. 616		331. 33	2. 560			

Motion doubtful.

π Capricorni.

$\alpha = 20^h\ 20^m.5$ $\delta = -18^\circ\ 36'$ (5 and 9.)

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$\circ$	$''$			
1889.668	19.8	144.9	3.43	2	383	No motion.
9.707	20.1	145.3	3.43	2	383	
1889.688		145.10	3.43 ^o			

ι Delphini.

$\alpha = 20^h\ 24^m.2$ $\delta = 10^\circ\ 30'$ (6 and 10.)

1887.839	20.7	347.5	0.76	3	606	
7.842	20.5	347.3	0.82	3	606	
1887.840		347.40	0.790			

Σ 2690. A and $\frac{B\ C}{2}$

$\alpha = 20^h\ 25^m.4$ $\delta = 10^\circ\ 52'$ (7 and 8.)

1884. 638	19. 6	255. 3	15. 30	3	606	
4. 663	19. 4	254. 9	15. 41	2	606	
1884. 650	$\Delta \rho =$	254 10	15. 355			
		0. 00	+ 0. 004			
		255. 10	15. 359			
					Change in distance.	

Σ 2690. B and C .

1884.663	19.6	25.7	0.59	2	606	
4.677	19.5	212.8	0.55	2	606	
4.679	19.6	213.8	0.52	2	606	
1884.673		210.77	0.553			

Σ 2696.

$\alpha = 20^h\ 27^m.6$ $\delta = 5^\circ\ 1'$ (8 and 9.)

1884.614	20.1	297.1	0.66	2	606	Motion doubtful.
4.616	19.7	300.3	0.79	2	606	
4.619	19.7	299.5	0.75	2	606	
1884.616		298.97	0.733			

Σ 2703. *A* and *B*.

$$\alpha = 20^{\text{h}} 31^{\text{m}}.2 \quad \delta = 14^{\circ} 19' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	'			
1890. 676	18. 5	110. 43	25. 27	2	383	
o. 678	18. 8	110. 20	25. 33	3	383	
o. 692	19. 0	110. 17	25. 44	2	383	
o. 714	18. 8	110. 05	25. 30	2	383	
o. 717	18. 8	110. 25	25. 44	2	383	
1890. 695		110. 22	25. 356			
	$\Delta \rho =$	0. 00	+ 0. 007			
		110. 22	25. 363			

 Σ 2703. *A* and *C*. (8 and 8.)

1890. 676	18. 7	216. 73	58. 79	2	383	
o. 678	19. 0	216. 70	58. 98	3	383	
o. 692	19. 2	216. 85	58. 81	2	383	
o. 714	19. 0	216. 85	58. 85	2	383	
o. 717	19. 0	216. 73	58. 92	2	383	
1890. 695		216. 77	58. 870			
	$\Delta \rho =$	0. 00	+ 0. 018			
		216. 77	58. 888			

 Σ 2703. *B* and *C*. (8 and 8.)

1890. 676	18. 9	57. 05	70. 29	2	383	This triple star was observed in 1879, and the adjusted values of the angles and distances were: ° "
o. 678	19. 2	56. 97	70. 19	3	383	
o. 692	19. 4	57. 25	70. 02	2	383	
o. 714	19. 2	57. 10	70. 28	2	383	
o. 717	19. 3	57. 05	70. 10	2	383	
1890. 695		57. 08	70. 176			
	$\Delta \rho =$	0. 00	+ 0. 021			$p = 110. 405 \quad s = 25. 381$
		57. 08	70. 197			$= 217. 091 \quad = 58. 021$
						$= 237. 510 \quad = 69. 687$

 β Delphini.

$$\alpha = 20^{\text{h}} 31^{\text{m}}.9 \quad \delta = 14^{\circ} 11' \quad (4 \text{ and } 6.)$$

1880. 734	19. 7	213. 3	0. 20	3	888	By estimation.
o. 781	20. 8	215. 7	0. 25	3	888	By estimation.
1884. 685	18. 8	193. 7	0. 32	3	888	Elongated.
4. 690	19. 2	199. 4	0. 31	2	888	Elongated.
4. 709	19. 1	194. 7	0. 34	2	888	Elongated.

β Delphini—Continued.

$a = 20^h\ 31^m.9$ $\delta = 14^\circ\ 11'$ (4 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	′			
1886. 711	19. 3	. .	. .	3	888	Single; single also with 606.
6. 837	20. 7	. .	. .	3	888	Single; single also with 383 and 606.
1891. 609	17. 9	328. 4	0. 41	3	888	
1. 642	18. 5	331. 9	0. 34	2	888	
1. 686	18. 5	329. 8	0. 42	2	888	
1880. 758		214. 50	0. 225			
1884. 695		195. 93	0. 323			
1891. 646		330. 07	0. 390			This star was discovered by S. W. BURNHAM. It appears to be a rapid binary.

$O\Sigma\ 533.$

$a = 20^h\ 33^m.4$ $\delta = 9^\circ\ 40'$ (5 and 11.)

1884. 625	19. 6	319. 0	12. 06	2	383	
4. 635	19. 3	318. 4	12. 17	2	383	
1884. 630	$\Delta p =$	318. 70	12. 115			
		0. 00	+ 0. 004			
		318. 70	12. 119			Motion.

$\Sigma\ 2708.$ A and $B.$

$a = 20^h\ 34^m.1$ $\delta = 38^\circ\ 13'$ (7 and 9.)

1884. 696	19. 5	332. 0	23. 78	2	606	
4. 698	19. 1	332. 2	23. 70	2	383	
4. 704	19. 4	333. 0	23. 78	2	383	
1886. 673	18. 8	332. 45	24. 29	3	383	
6. 675	18. 6	333. 20	24. 23	3	606	
6. 678	18. 7	332. 40	24. 22	3	383	
1887. 710	19. 3	332. 05	24. 47	2	383	
7. 718	19. 9	331. 82	24. 42	2	606	A faint companion: $p = 40^\circ$; $s = 15''$; mag. = 15.
1884. 699		332. 40	23. 753			
1886. 675		332. 68	24. 247			
1887. 714		331. 93	24. 445			
	$\Delta p =$	0. 00	+ 0. 007			
		332. 40	23. 760			
		332. 68	24. 254			
		331. 93	24. 452			An increase of distance.

Σ 2708. *A* and *C*. (7 and 15.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887. 718	h. 19. 6	° 37. 9	" 15. 10	2	606	
49 Cygni = Σ 2716.						
$\alpha = 20^h 36^m.2 \quad \delta = 31^\circ 53'$ (6 and 8.)						
1886. 656	18. 8	50. 2	2. 71	2	383	
6. 659	18. 3	50. 9	2. 75	2	383	
6. 667	18. 8	49. 4	2. 85	2	383	
1886. 661		50. 17	2. 770			No motion.
Σ 2723.						
$\alpha = 20^h 39^m.2 \quad \delta = 11^\circ 53'$ (7 and 8.)						
1887. 842	20. 7	95. 1	1. 27	3	606	
7. 847	20. 8	96. 5	1. 17	3	383	Cloudy.
1887. 845		95. 80	1. 220			Motion in angle.
Σ 2725.						
$\alpha = 20^h 40^m.6 \quad \delta = 15^\circ 28'$ (7 and 8.)						
1884. 616	20. 0	1. 3	5. 08	2	383	
4. 619	19. 9	1. 9	5. 11	2	606	
4. 622	19. 7	2. 6	5. 16	2	383	
1884. 619		1. 93	5. 117			Motion doubtful.
γ Delphini = Σ 2727.						
$\alpha = 20^h 41^m.1 \quad \delta = 15^\circ 41'$ (4 and 6.)						
1884. 698	19. 3	270. 6	10. 97	2	383	
4. 709	20. 1	270. 6	11. 24	2	383	
4. 712	20. 6	271. 4	11. 37	2	383	
1885. 673	19. 4	269. 7	11. 05	2	383	
5. 684	18. 9	269. 8	11. 13	2	383	Blazing images.
5. 701	19. 2	269. 4	11. 42	2	383	Blazing images.
5. 706	18. 6	269. 6	11. 22	3	383	
1886. 659	18. 7	269. 6	11. 17	2	383	
6. 667	19. 1	269. 2	11. 18	2	383	
6. 673	19. 2	268. 5	11. 27	3	383	

γ Delphini = Σ 2727—Continued.

$$\alpha = 20^{\text{h}} 41^{\text{m}}.1 \quad \delta = 15^{\circ} 41' \quad (4 \text{ and } 6.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	o.	//			
1887.765	20.3	271.0	11.09	2	606	
7.781	19.5	270.1	11.12	3	383	
7.790	20.3	270.6	11.15	2	606	
1888.701	19.8	269.7	11.14	3	383	
8.707	19.7	270.3	11.10	3	383	
8.759	19.7	270.1	11.03	2	383	
1889.731	20.7	270.2	11.15	3	383	
9.794	20.2	271.4	11.20	2	383	
9.797	20.7	270.0	11.08	3	383	
9.799	20.9	270.7	11.26	3	606	
1884.706		270.87	11.196			
1885.690		269.63	11.185			
1886.666		269.10	11.210			
1887.779		270.57	11.123			
1888.722		270.03	11.093			
1889.780		270.58	11.175			An extremely slow motion. $\Delta \rho = 0^{\circ}.00$: $\Delta s = +0''.003$

 $O\Sigma$ 413 = λ Cygni.

$$\alpha = 20^{\text{h}} 42^{\text{m}}.7 \quad \delta = 35^{\circ} 59' \quad (6 \text{ and } 7.)$$

1885.736	19.4	78.1	0.59	3	606	
5.739	18.9	74.3	0.69	2	606	
5.744	19.1	76.6	0.68	3	606	
1886.735	19.3	77.4	0.69	3	606	
6.741	19.4	80.4	0.68	2	606	
1887.768	19.6	73.7	0.63	2	606	
7.781	19.7	80.8	0.61	2	606	Blurred images.
7.790	20.0	72.3	0.68	2	606	
7.809	20.2	71.3	0.72	3	606	
1885.740		76.33	0.653			
1886.738		78.90	0.685			
1887.788		73.63	0.667			Motion in angle.

 Σ 2728.

$$\alpha = 20^{\text{h}} 43^{\text{m}}.1 \quad \delta = 25^{\circ} 57' \quad (8 \text{ and } 10.)$$

1889.668	18.8	25.0	6.11	3	383	
9.682	19.0	133.8	16.91	3	383	Not Σ 2728.
9.693	18.8	25.3	5.99	2	383	
9.706	18.8	24.3	6.06	3	383	
1889.689		24.87	6.053			An increase of distance.

Σ 2729.

$$\alpha = 20^{\text{h}} 45^{\text{m}}.1 \quad \delta = -6^{\circ} 4' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	′			
1885. 736	19. 7	173. 2	0. 49	3	606	Images blurred.
5. 739	19. 3	162. 2	0. 54	2	606	
5. 747	19. 1	165. 5	0. 39	2	888	
1886. 837	20. 9	174. 8	0. 51	2	606	
6. 840	20. 8	174. 8	0. 43	2	888	
1887. 768	19. 8	173. 5	0. 47	2	606	
7. 790	20. 5	178. 6	0. 46	2	606	
7. 809	20. 6	175. 7	0. 66	2	606	
1885. 741		167. 92	0. 460			A slow motion.
1886. 838		174. 80	0. 470			
1887. 789		175. 93	0. 530			

 $O\Sigma$ 418.

$$\alpha = 20^{\text{h}} 49^{\text{m}}.9 \quad \delta = 32^{\circ} 15' \quad (7 \text{ and } 8.)$$

1884. 698	20. 0	289. 7	1. 06	2	606	Motion doubtful.
4. 712	19. 5	291. 4	1. 02	2	606	
4. 778	19. 9	290. 0	0. 99	3	606	
1884. 729		290. 37	1. 023			

 $O\Sigma$ 423.

$$\alpha = 20^{\text{h}} 50^{\text{m}}.9 \quad \delta = 42^{\circ} 4' \quad (7 \text{ and } 9.)$$

1884. 698	19. 8	79. 1	2. 86	2	383	Images blazing.
4. 712	19. 3	81. 0	2. 90	2	606	
4. 775	19. 8	81. 2	2. 64	2	383	
1884. 728		80. 28	2. 832			No motion.

 Σ 2737. A and B.

$$\alpha = 20^{\text{h}} 53^{\text{m}}.1 \quad \delta = 3^{\circ} 50' \quad (6 \text{ and } 7.)$$

1885. 706	19. 6	284. 7	1. 00	2	606	Motion.
5. 714	19. 0	281. 9	0. 95	2	383	
1886. 716	20. 4	285. 6	0. 81	2	606	
6. 733	20. 5	286. 8	0. 75	3	606	
1885. 710		283. 30	0. 975			
1886. 724		286. 20	0. 780			

Σ **2737.** $\frac{A}{2} \frac{B}{2}$ and $C.$ (6 and 8.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$//$			
1885. 706	19. 9	75. 1	10. 75	2	606	
5. 714	19. 2	74. 8	10. 90	2	383	
1886. 716	20. 7	74. 7	10. 85	2	606	
6. 733	20. 7	75. 6	11. 02	3	606	
1885. 710		74. 95	10. 828			
1886. 724		75. 15	10. 938			$\Delta p = 0^{\circ}.00 : \Delta s = +0''.003.$

Σ **2741.**

$\alpha = 20^{\text{h}} 54^{\text{m}}.6$ $\delta = 49^{\circ} 59'$ (6 and 7.)

1886. 735	19. 9	33. 4	1. 83	3	383	
6. 741	19. 7	33. 8	1. 80	2	606	Cloudy.
1886. 738		33. 60	1. 815			Motion doubtful.

Σ **2744.**

$\alpha = 20^{\text{h}} 57^{\text{m}}.0$ $\delta = 1^{\circ} 4'$ (6 and 7.)

1884. 698	20. 5	171. 1	1. 52	2	606	
4. 709	20. 7	170. 3	1. 67	2	606	
4. 712	20. 3	172. 1	1. 66	2	606	
1884. 706		171. 17	1. 617			Motion in angle.

Σ **2746.**

$\alpha = 20^{\text{h}} 57^{\text{m}}.1$ $\delta = 38^{\circ} 46'$ (8 and 9.)

1884. 698	20. 2	296. 0	1. 01	2	606	
4. 709	20. 4	295. 6	0. 98	2	606	
4. 712	19. 9	295. 4	1. 05	2	606	
1884. 706		295. 67	1. 013			Motion in angle.

12 Aquarii.

$\alpha = 20^{\text{h}} 57^{\text{m}}.7$ $\delta = -6^{\circ} 18'$ (6 and 8.)

1886. 656	19. 3	188. 8	2. 74	2	383	
6. 659	19. 2	188. 3	2. 82	2	383	
6. 673	19. 6	190. 3	2. 82	2	383	
1886. 663		189. 13	2. 793			

Σ 2749. A and B.

$$\alpha = 20^{\text{h}} 58^{\text{m}}.7 \quad \delta = 3^{\circ} 3' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1887. 842	h. 20. 9	$^{\circ}$ 154. 7	$''$ 2. 85	3	606	
7. 847	21. 1	155. 9	2. 86	2	606	
1887. 844		155. 30	2. 855			

 Σ 2749. A and C. (8 and 9.)

1887. 842	21. 0	154. 7	4. 20	3	606	
7. 847	21. 2	155. 9	4. 17	2	606	
1887. 844		155. 30	4. 185			Motion doubtful.

 Σ 2751.

$$\alpha = 20^{\text{h}} 58^{\text{m}}.8 \quad \delta = 56^{\circ} 12' \quad (6 \text{ and } 7.)$$

1889. 668	19. 3	350. 9	1. 56	3	383	
9. 674	18. 3	350. 0	1. 72	2	606	
9. 682	18. 3	348. 7	1. 57	3	606	
1889. 675		349. 87	1. 617			Motion doubtful.

61 Cygni = Σ 2758.

$$\alpha = 21^{\text{h}} 1^{\text{m}}.1 \quad \delta = 38^{\circ} 7' \quad (6 \text{ and } 6.)$$

1880. 734	20. 2	118. 08	20. 05	3	606	
0. 737	20. 0	118. 00	20. 06	2	383	
0. 742	20. 8	117. 75	20. 04	2	383	Cloudy.
0. 750	19. 9	118. 02	20. 11	2	383	
0. 753	19. 5	117. 92	20. 12	3	383	
0. 756	20. 1	117. 71	20. 10	2	383	$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.006.$
1881. 564	21. 8	117. 7	20. 18	3	383	
1. 566	21. 8	117. 4	20. 18	2	383	
1. 616	19. 1	118. 6	20. 20	3	383	
1. 624	18. 9	118. 9	20. 10	2	383	
1. 627	19. 2	118. 5	20. 22	3	383	$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.006.$
1882. 755	20. 2	119. 0	20. 29	2	383	Images blurred.
2. 757	21. 6	118. 2	20. 20	2	383	
2. 760	20. 8	118. 6	20. 41	2	606	
2. 763	19. 9	118. 7	20. 35	3	383	
2. 766	21. 8	118. 6	20. 28	2	383	$\Delta p = 0^{\circ}.00 : \Delta s = + 0''.006.$

61 Cygni = Σ 2758—Continued.

$$\alpha = 21^{\text{h}} 1^{\text{m}}.1 \quad \delta = 38^{\circ} 7' \quad (6 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1883.770	20.5	118.3	20.55	2	383	
3.773	19.8	119.1	20.62	3	383	
3.776	19.9	119.4	20.54	3	383	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006.$
1884.657	19.6	119.8	20.42	2	383	
4.663	19.9	119.8	20.56	3	383	
4.674	19.7	119.5	20.52	2	383	Very unsteady.
4.677	20.1	119.7	20.53	2	383	
4.679	19.8	119.7	20.50	2	383	
4.685	19.6	119.7	20.44	2	383	$\Delta = 0^{\circ}.00 : \Delta s = +0''.006.$
1885.701	19.5	120.3	20.64	2	383	Images blazing.
5.703	19.6	120.1	20.58	2	383	Images blazing.
5.706	19.1	120.6	20.55	3	383	
5.714	18.8	120.5	20.68	2	383	Telescope shaken by wind.
5.717	19.2	120.0	20.60	3	383	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$
1886.634	19.2	120.42	20.61	3	383	
6.637	20.1	120.72	20.74	2	383	
6.640	19.1	120.70	20.65	2	383	
6.651	18.0	120.49	20.65	2	383	
6.653	19.5	120.40	20.77	3	383	
6.656	19.0	120.10	20.78	2	383	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$
1887.625	19.1	120.6	20.72	3	383	Clock running fast.
7.634	19.0	121.3	20.80	2	383	
7.680	18.6	120.2	20.70	2	383	
7.710	19.7	120.2	20.75	2	383	
7.718	19.2	120.1	20.79	2	606	
7.762	19.6	120.7	20.78	2	606	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$
1888.652	18.9	121.3	20.95	2	383	Blazing images.
8.707	19.4	120.8	20.83	3	383	
8.759	19.5	120.4	20.94	2	383	
8.762	19.3	121.3	21.07	2	383	
8.775	19.5	121.05	21.01	2	383	
8.833	20.3	120.8	20.86	3	383	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$
1889.630	18.3	121.4	21.14	2	383	
9.635	18.9	121.4	21.07	2	383	
9.641	19.4	121.4	21.10	2	383	
9.649	19.8	121.7	21.06	3	606	
9.663	19.5	121.1	21.03	3	383	
9.668	19.1	121.7	21.07	3	383	
9.682	18.8	121.5	21.11	3	606	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$
1890.676	18.2	122.00	21.10	2	383	
0.678	18.4	121.73	21.05	2	383	
0.692	18.5	121.80	21.05	2	383	Windy.
0.714	18.5	121.95	21.05	2	383	
0.717	18.5	121.70	21.07	2	383	
0.719	18.2	121.95	21.02	2	383	$\Delta p = 0^{\circ}.00 : \Delta s = +0''.006$

61 Cygni = Σ 2758—Continued.

$a = 21^h\ 1^m.1$ $\delta = 38^\circ\ 7'$ (6 and 6.)

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1891. 609	17. 7	121. 6	21. 27	2	383	
1. 618	18. 2	122. 0	21. 17	2	383	
1. 620	18. 3	122. 4	21. 29	2	383	
1. 623	18. 1	121. 9	21. 26	2	383	Cloudy.
1. 642	18. 3	122. 1	21. 24	2	383	
1. 667	18. 6	121. 95	21. 20	2	383	Cloudy. $\Delta p = 0^{\circ}.00$: $\Delta s = + 0''.006$
1880. 745		117. 91	20. 086			
1881. 599		118. 22	20. 182			
1882. 760		118. 62	20. 312			
1883. 773		118. 93	20. 576			
1884. 672		119. 70	20. 501			
1885. 708		120. 30	20. 616			
1886. 645		120. 47	20. 706			
1887. 688		120. 52	20. 763			
1888. 748		120. 94	20. 949			
1889. 653		121. 46	21. 089			
1890. 699		121. 86	21. 063			
1891. 630		121. 99	21. 244			These stars are remarkable for their large proper motion. The motion is nearly rectilinear, but the stars are probably binary. The data now at hand may be sufficient to decide this question.

Σ 2760.

$a = 21^h\ 1^m.7$ $\delta = 33^\circ\ 38'$ (7 and 8.)

1885. 701	19. 8	224. 8	7. 90	2	383	
5. 703	19. 3	225. 7	7. 95	2	383	
5. 706	18. 9	225. 4	7. 75	3	383	
1885. 703		255. 30	7. 867			Diminution of distance.

$O\Sigma$ 527.

$a = 21^h\ 2^m.4$ $\delta = 4^\circ\ 40'$ (7 and 8.)

1884. 778	20. 7	283. 6	0. 49	2	606	
1886. 733	21. 0	279. 6	0. 29	3	888	
6. 735	20. 6	276. 0	0. 37	2	888	
1884. 778		283. 6	0. 49			
1886. 734		277. 80	0. 330			Motion.

γ **Equulei.**

$$\alpha = 21^{\text{h}} 4^{\text{m}}.5 \quad \delta = 9^{\circ} 39' \quad (5 \text{ and } 12.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1883.770	21.2	275.0	2.18	2	383	
3.773	20.2	275.1	2.21	3	383	
3.776	20.2	273.6	2.12	3	383	
1884.712	21.2	272.0	2.63	2	383	
4.778	20.2	277.2	2.38	3	606	
4.838	21.2	278.3	2.24	2	383	
1883.773		274.57	2.170			
1884.776		275.83	2.417			

Anonyma.

$$\alpha = 21^{\text{h}} 5^{\text{m}}.7 \quad \delta = -15^{\circ} 31' \quad (8 \text{ and } 8.)$$

1884.698	20.9	319.4	3.06	2	383	
4.712	20.9	138.1	3.12	2	383	
4.778	20.4	138.7	3.05	2	383	
1884.729		138.73	3.077			

 δ **Equulei = Σ 2777.**

$$\alpha = 21^{\text{h}} 8^{\text{m}}.6 \quad \delta = 9^{\circ} 31' \quad (4 \text{ and } 5.)$$

1886.837	21.2	201.1	0.49	2	606	
6.840	21.0	205.9	0.45	2	606	Hazy.
1887.768	20.1	201.1	0.39	2	888	
7.790	20.7	198.8	0.41	2	606	
7.809	20.4	200.3	0.44	3	606	
7.828	20.7	194.5	0.41	2	606	
1886.838		203.50	0.470			
1887.799		198.68	0.412			Motion.

 Σ **2779.**

$$\alpha = 21^{\text{h}} 9^{\text{m}}.3 \quad \delta = 28^{\circ} 35' \quad (8 \text{ and } 9.)$$

1883.776	20.6	183.2	17.66	3	383	
1888.707	20.0	182.0	17.65	3	383	
8.759	20.0	182.2	17.66	2	383	
8.762	19.5	182.1	17.61	2	383	
1883.776		183.2	17.66			
1888.743		182.10	17.640			
	$\Delta p =$	0.00	+ 0.005			
		183.2	17.66			
		182.10	17.645			Motion doubtful.

τ Cygni.

$$\alpha = 21^{\text{h}} 10^{\text{m}}.0 \quad \delta = 37^{\circ} 32' \quad (5 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1885.736	20.0	100.7	0.62	2	888	Blazing images.
1891.686	18.2	9.8	0.62	2	888	Blazing.
1.692	18.2	8.8	0.44	2	888	Blazing.
1.711	18.2	9.2	0.50	2	888	Blazing.
1885.736		100.7	0.62			Diminution of angle and distance. The change of angle is 138° since 1879.
1891.696		9.27	0.520			

A. C. 19.

$$\alpha = 21^{\text{h}} 11^{\text{m}}.4 \quad \delta = 63^{\circ} 55' \quad (7 \text{ and } 7.)$$

1889.668	19.5	250.0	0.67	3	606	
9.674	18.5	251.6	0.64	2	606	
9.682	18.5	250.3	0.60	3	606	
1889.675		250.63	0.637			

Lalande 41386.

$$\alpha = 21^{\text{h}} 12^{\text{m}}.8 \quad \delta = 11^{\circ} 4' \quad (7 \text{ and } 10.)$$

1887.768	20.6	252.0	0.77	2	606	
7.790	21.0	250.4	0.61	2	606	
7.828	21.0	251.4	0.66	2	606	
1887.795		251.27	0.680			

 Σ 2786.

$$\alpha = 21^{\text{h}} 13^{\text{m}}.8 \quad \delta = 9^{\circ} 1' \quad (8 \text{ and } 9.)$$

1887.842	21.2	186.6	2.47	3	606	
7.847	21.3	185.7	2.50	2	606	
1887.845		186.15	2.485			Motion doubtful.

O Σ 437.

$$\alpha = 21^{\text{h}} 15^{\text{m}}.8 \quad \delta = 31^{\circ} 56' \quad (6 \text{ and } 7.)$$

1888.707	20.3	46.3	1.52	3	606	
8.759	20.2	48.1	1.44	2	383	
8.762	19.7	47.1	1.45	2	383	
1888.743		47.17	1.470			Motion in angle.

Σ 2797.

$$a = 21^{\text{h}} 20^{\text{m}}.9 \quad \delta = 13^{\circ} 10' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1887.842	h. 21.4	° 217.3	' 3.31	3	606	Motion doubtful.
7.847	21.5	219.1	3.38	3	606	
1887.845		218.20	3.345			

 Σ 2801.

$$a = 21^{\text{h}} 22^{\text{m}}.0 \quad \delta = 79^{\circ} 50' \quad (7 \text{ and } 8.)$$

1889.707	19.1	273.8	1.53	3	383	No motion.
9.717	18.5	274.4	1.73	2	383	
9.726	18.9	276.2	1.49	2	383	
1889.717		274.80	1.583			

 Σ 2799.

$$a = 21^{\text{h}} 23^{\text{m}}.0 \quad \delta = 10^{\circ} 34' \quad (7 \text{ and } 7.)$$

1884.778	20.9	305.3	1.52	2	606	Motion in angle.
1885.706	20.2	304.4	1.44	2	606	
5.714	19.5	127.4	1.35	2	383	
5.717	19.6	127.6	1.41	3	383	
1884.778		305.3	1.52			
1885.712		126.47	1.400			

 Σ 2804.

$$a = 21^{\text{h}} 27^{\text{m}}.4 \quad \delta = 20^{\circ} 11' \quad (7 \text{ and } 8.)$$

1884.855	21.6	326.6	2.83	2	383	Clouds.
4.857	21.7	327.7	2.85	2	383	
1886.733	21.3	330.9	2.82	3	606	
6.735	20.3	330.4	2.87	3	383	
1884.856		327.15	2.840			Motion in angle.
1886.734		330.65	2.845			

Anonyma.

$$a = 21^{\text{h}} 32^{\text{m}}.0 \quad \delta = -16^{\circ} 10' \quad (9 \text{ and } 12.)$$

1887.768	21.1	121.4	2.07	2	383	Faint.
7.790	21.3	130.8	2.02	2	606	
1887.779		127.60	2.045			

μ Cygni = Σ 2822.

$$a = 21^{\text{h}} 38^{\text{m}}.7 \quad \delta = 28^{\circ} 13' \quad (5 \text{ and } 6.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	"			
1886. 673	20. 0	121. 2	3. 40	2	383	
6. 676	19. 0	121. 7	3. 38	2	606	
6. 678	19. 0	121. 6	3. 42	2	383	
6. 684	20. 2	120. 6	3. 28	2	383	
1889. 756	21. 0	121. 3	3. 10	2	383	
9. 758	20. 6	121. 3	3. 17	3	383	
9. 764	20. 4	122. 0	3. 31	3	383	
9. 778	20. 1	120. 6	3. 14	2	383	
1886. 678		121. 28	3. 370			
1889. 764		121. 30	3. 180			A slow motion.

 Σ 2824.

$$a = 21^{\text{h}} 39^{\text{m}}.2 \quad \delta = 25^{\circ} 6' \quad (4 \text{ and } 13.)$$

1888. 775	19. 8	300. 5	11. 95	2	383	
8. 833	20. 6	301. 2	12. 19	3	383	
8. 838	29. 7	298. 3	12. 25	3	383	
1888. 815		300. 00	12. 130			
	$\Delta p =$	0. 00	+ 0. 004			
		300. 00	12. 134			Motion in angle.

 Σ 2825.

$$a = 21^{\text{h}} 40^{\text{m}}.8 \quad \delta = 0^{\circ} 17' \quad (8 \text{ and } 9.)$$

1887. 842	21. 7	112. 6	1. 00	3	606	
7. 847	21. 7	115. 1	0. 96	2	606	
1887. 844		113. 85	0. 980			Perhaps motion in angle.

 Σ 2837.

$$a = 21^{\text{h}} 42^{\text{m}}.8 \quad \delta = 82^{\circ} 23' \quad (8 \text{ and } 9.)$$

1889. 707	19. 3	298. 3	2. 40	3	383	
9. 717	18. 8	298. 5	2. 36	2	383	
9. 726	19. 1	299. 0	2. 39	2	383	
1889. 717		298. 60	2. 383			Motion in angle.

Σ 2828. *A* and *B*.

$$\alpha = 21^{\text{h}} 43^{\text{m}}.5 \quad \delta = 2^{\circ} 51' \quad (8 \text{ and } 9.)$$

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	//			
1888. 890	21. 7	133. 2	26. 69	2	383	
8. 893	21. 7	132. 9	26. 43	3	383	
8. 920	22. 5	133. 3	26. 61	2	383	
1888. 901		133. 13	26. 577			
	$\Delta p =$	0. 00	+ 0. 009			
		133. 13	26. 586			Motion.

Σ 2828. *A* and *C*. (9 and 9.)

1888.890	21.9	219.4	3.94	2	383	
8.893	21.9	218.5	3.88	3	383	
8.920	22.7	219.2	3.69	2	383	
1888.901		219.03	3.837			

Σ 2833.

$$\alpha = 21^{\text{h}} 46^{\text{m}}.0 \quad \delta = 8^{\circ} 31' \quad (7 \text{ and } 10.)$$

1888.893	22.1	337.7	9.15	3	383	
8.896	22.1	338.3	9.01	3	383	
8.920	22.9	338.6	9.15	2	383	
1888.903		338.20	9.103			

Motion doubtful

Σ 2842.

$$\alpha = 21^{\text{h}} 47^{\text{m}}.9 \quad \delta = 63^{\circ} 28' \quad (8 \text{ and } 11.)$$

1889.707	19.6	100.2	3.62	3	383	Faint.
9.717	19.1	101.4	3.58	3	383	
1889.712		100.80	3.600			No motion.

Σ 2846.

$$\alpha = 21^{\text{h}} 50^{\text{m}}.1 \quad \delta = 45^{\circ} 13' \quad (8 \text{ and } 10.)$$

1889.693	19.4	266.8	3.44	3	383	Faint; hazy.
9.707	19.8	265.4	3.49	3	383	
1889.700		266.10	3.465			No motion.

OΣ 456.

$$\alpha = 21^{\text{h}} 51^{\text{m}}.2 \quad \delta = 51^{\circ} 59' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	°	'			
1889. 731	18. 9	31. 6	1. 40	3	606	
9. 742	18. 9	30. 4	1. 37	2	383	
9. 745	18. 9	31. 9	1. 34	2	383	
1889. 740		31. 30	1. 370			No motion.

Σ 2847.

$$\alpha = 21^{\text{h}} 51^{\text{m}}.9 \quad \delta = -4^{\circ} 4' \quad (8 \text{ and } 8.)$$

1885. 706	20. 9	297. 3	1. 20	2	383	
5. 714	21. 5	299. 4	1. 21	2	383	
5. 717	20. 0	307. 0	1. 24	2	383	Blurred images.
1886. 837	21. 5	298. 8	0. 99	2	606	
6. 840	21. 3	301. 0	1. 02	3	606	
1887. 768	21. 5	302. 2	1. 11	2	606	
7. 809	21. 7	298. 8	1. 03	2	606	
1885. 711		300. 08	1. 212			
1886. 838		299. 90	1. 005			
1887. 788		300. 50	1. 070			No motion.

Σ 2849.

$$\alpha = 21^{\text{h}} 52^{\text{m}}.1 \quad \delta = 19^{\circ} 40' \quad (8 \text{ and } 11.)$$

1887. 842	21. 9	262. 7	1. 55	3	606	
7. 847	22. 0	263. 0	1. 71	2	606	Faint.
1887. 845		262. 85	1. 630			Motion in angle.

OΣ 458.

$$\alpha = 21^{\text{h}} 52^{\text{m}}.7 \quad \delta = 59^{\circ} 13' \quad (7 \text{ and } 8.)$$

1889. 731	19. 2	353. 1	0. 77	3	606	
9. 742	19. 2	351. 9	0. 87	2	606	
9. 745	19. 1	352. 8	0. 80	2	606	
1889. 740		352. 60	0. 813			No motion.

η **Piscis Australis.**

$$a = 21^h 54^m.0 \quad \delta = -28^\circ 55' \quad (5 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1885.810	h. 21.9	° 118.9	" 1.85	2	383	Images blurred.
5.933	22.5	117.3	1.78	2	383	Images blurred; windy.
1887.768	21.8	116.9	1.85	2	383	Images blurred.
7.809	21.9	114.5	1.78	2	383	Images blurred.
1885.872		118.10	1.815			
1887.788		115.70	1.815			Discovered by J. R. EASTMAN.

 Σ **2860.**

$$a = 21^h 59^m.4 \quad \delta = 60^\circ 16' \quad (8 \text{ and } 9.)$$

1889.726	19.4	255.4	6.76	2	383	
9.731	18.7	255.4	6.77	3	383	
1889.728		255.40	6.765			Increase of distance.

 Σ **2856.**

$$a = 21^h 59^m.8 \quad \delta = 4^\circ 17' \quad (8 \text{ and } 9.)$$

1887.842	22.1	202.9	1.24	3	606	
7.847	22.1	203.0	1.16	2	606	
1887.844		202.95	1.200			No motion.

 Σ **2863.**

$$a = 22^h 0^m.3 \quad \delta = 64^\circ 3' \quad (5 \text{ and } 7.)$$

1889.731	19.4	283.5	6.62	3	606	
9.742	19.3	282.5	6.73	2	383	
9.745	19.3	282.9	6.78	2	383	
1889.739		282.97	6.710			Motion in angle.

 Σ **2872.** A and $\frac{B \ C}{2}$.

$$a = 22^h 4^m.5 \quad \delta = 58^\circ 41' \quad (6 \text{ and } 7.)$$

1885.846	21.3	315.6	21.87	2	606	
5.889	21.8	316.2	21.54	3	606	
1885.868		315.90	21.705			
	$\Delta p =$	0.00	+ 0.006			
		315.90	21.711			

Σ 2872. *B* and *C*. (7 and 8.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1885.846	h. 21.1	° 139.3	" 0.61	2	606	Motion.
5.889	21.7	319.0	0.58	3	606	
1885.868		139.15	0.595			

 $O\Sigma$ 463. $\alpha = 22^{\text{h}} 4^{\text{m}}.5$ $\delta = 13^{\circ} 9'$ (8 and 11.)

1887.842	22.3	354.3	4.46	3	606	Companion is 13th magnitude.
7.874	22.3	353.5	4.49	2	383	
1887.858		353.90	4.475			Motion doubtful.

41 Aquarii.

 $\alpha = 22^{\text{h}} 7^{\text{m}}.7$ $\delta = -21^{\circ} 40'$ (6 and 8.)

1886.716	21.1	115.8	5.08	2	383	
6.733	21.5	114.9	4.90	2	606	
6.735	21.0	116.4	5.04	2	385	
1886.728		115.70	5.007			

 Σ 2878. $\alpha = 22^{\text{h}} 8^{\text{m}}.5$ $\delta = 7^{\circ} 23'$ (7 and 8.)

1887.842	22.5	129.1	1.36	3	606	No motion.
7.877	21.6	129.1	1.22	3	383	
1887.860		129.10	1.290			

 Σ 2881. $\alpha = 22^{\text{h}} 9^{\text{m}}.1$ $\delta = 28^{\circ} 57'$ (7 and 8.)

1885.706	21.2	100.9	1.75	2	383	Telescope shaken by wind.
5.714	19.8	102.8	1.61	2	383	
5.717	19.8	104.2	1.50	3	383	
1885.712		102.63	1.620			Motion in angle.

30 Pegasi. *A* and *B*.

$$\alpha = 22^{\text{h}} 14^{\text{m}}.0 \quad \delta = 5^{\circ} 10' \quad (6 \text{ and } 12.)$$

Date	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
	h.	°	"			
1885.736	20.2	21.2	6.06	3	606	
5.739	20.9	22.7	6.32	2	383	
5.747	20.1	23.1	6.31	3	383	
1886.908	22.6	18.9	6.22	3	383	
6.911	22.3	18.2	6.27	3	383	
1887.768	22.3	19.5	6.25	2	383	
7.781	21.5	18.5	6.26	3	383	
1885.741		22.33	6.230			
1886.910		18.55	6.245			
1887.774		19.00	6.255			Motion.

30 Pegasi. *A* and *C*. (6 and 12.)

1885.736	20.4	222.0	10.66	3	606	
5.739	21.1	219.9	10.51	2	383	
5.747	20.3	221.6	10.73	3	383	
1886.908	22.7	221.9	10.60	3	383	
6.911	22.5	222.1	10.83	3	383	
1887.768	22.4	221.7	10.67	2	383	
7.781	21.7	221.6	10.70	3	383	
1885.741		221.17	10.633			
1886.910		222.00	10.715			
1887.774		221.65	10.685			

Σ 2895.

$$\alpha = 22^{\text{h}} 15^{\text{m}}.1 \quad \delta = 24^{\circ} 20' \quad (8 \text{ and } 10.)$$

1884.855	22.1	31.1	7.06	2	383	
4.857	21.9	31.4	6.94	2	383	
1884.856		31.25	7.000			Motion.

OΣ 470.

$$\alpha = 22^{\text{h}} 17^{\text{m}}.3 \quad \delta = 66^{\circ} 22' \quad (7 \text{ and } 9.)$$

1889.745	19.8	357.9	3.93	2	383	
9.756	19.8	258.9	3.83	2	383	
1889.750		358.40	3.880			Motion doubtful.

Σ 2900. *A* and *B*.

$$\alpha = 22^{\text{h}} 17^{\text{m}}.9 \quad \delta = 20^{\circ} 15' \quad (6 \text{ and } 8.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1888.833	h. 20.9	° 176.6	" 1.77	2	383	Motion.
8.838	20.9	177.1	1.52	3	383	
8.849	22.1	179.6	1.76	3	383	
1888.840		177.77	1.683			

 Σ 2900. *A* and *C*. (8 and 9.)

1888.833	21.1	327.3	64.57	3	383	
8.838	21.0	327.3	64.52	3	383	
8.849	22.3	327.3	64.56	3	383	
1888.840	$\Delta \rho =$	327.30 0.00	64.550 + 0.021			
		327.30	64.571			

 Σ 2903.

$$\alpha = 22^{\text{h}} 18^{\text{m}}.3 \quad \delta = 66^{\circ} 5' \quad (7 \text{ and } 8.)$$

1889.731	19.6	95.5	4.23	3	606	No motion.
9.745	19.5	95.0	4.40	2	383	
1889.738		95.25	4.315			

53 Aquarii.

$$\alpha = 22^{\text{h}} 20^{\text{m}}.1 \quad \delta = -17^{\circ} 21' \quad (6 \text{ and } 6.)$$

1886.837	21.8	303.0	7.50	2	383	Diminution of distance.
6.840	21.9	304.1	7.50	3	606	
6.905	22.6	305.4	7.32	3	383	
1886.861		304.17	7.440			

ζ Aquarii = Σ 2909.

$$\alpha = 22^{\text{h}} 22^{\text{m}}.4 \quad \delta = -0^{\circ} 40' \quad (4 \text{ and } 5.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1880. 896	22. 7	333. 4	3. 46	3	383	
0. 898	22. 7	333. 9	3. 40	3	383	
1882. 763	21. 2	330. 4	3. 31	2	383	
2. 766	22. 2	331. 2	3. 37	2	383	
2. 818	21. 9	331. 5	3. 28	3	383	
1883. 770	21. 7	328. 8	3. 32	2	383	
3. 773	21. 1	329. 9	3. 23	2	383	
3. 776	21. 9	329. 8	3. 28	2	383	
1885. 714	21. 8	329. 0	3. 51	2	383	
5. 717	20. 9	328. 5	3. 40	2	383	
5. 736	20. 7	328. 3	3. 30	3	383	
1886. 840	21. 6	327. 3	3. 16	3	606	
6. 886	22. 3	328. 5	3. 27	1	383	Blazing images.
6. 905	22. 8	328. 2	3. 19	2	383	
1887. 828	21. 2	327. 2	3. 31	2	606	
7. 839	21. 1	326. 8	3. 34	2	383	
7. 877	21. 8	326. 1	3. 20	3	383	
1888. 838	21. 5	345. 7	3. 22	3	383	
8. 849	23. 4	323. 1	3. 34	2	383	
8. 852	21. 4	326. 0	3. 34	3	383	
1889. 731	20. 4	324. 6	3. 18	2	606	Hazy.
9. 756	21. 2	325. 6	3. 47	2	383	
9. 758	21. 5	324. 4	3. 40	2	383	
9. 778	22. 1	325. 5	3. 58	2	383	
1890. 719	20. 2	324. 7	3. 41	2	383	
0. 733	20. 8	324. 7	3. 30	2	383	
0. 736	21. 0	324. 5	3. 33	3	383	Cloudy.
0. 739	19. 9	325. 1	3. 21	3	383	
1880. 897		333. 65	3. 430			
1882. 782		331. 03	3. 320			
1883. 773		329. 50	3. 277			
1885. 722		328. 60	3. 403			
1886. 877		328. 00	3. 207			
1887. 848		326. 70	3. 283			
1888. 846		324. 93	3. 300			
1889. 756		325. 02	3. 408			
1890. 732		324. 75	3. 312			A very slow motion.
Σ 2910.						
$\alpha = 22^{\text{h}} 22^{\text{m}}.5 \quad \delta = 22^{\circ} 55' \quad (8 \text{ and } 9.)$						
1888. 833	21. 3	341. 7	5. 54	2	383	
8. 838	21. 3	341. 6	5. 40	3	383	
8. 852	21. 2	341. 3	5. 34	3	383	
1888. 841		341. 53	5. 427			Perhaps a change of angle.

Σ 2920.

$$\alpha = 22^{\text{h}} 28^{\text{m}}.2 \quad \delta = 3^{\circ} 32' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1884. 855	h. 22. 4	° 143. 6	' 13. 57	2	383	No motion.
4. 857	22. 2	144. 2	13. 67	2	383	
1884. 856	$\Delta \rho =$	143. 90	13. 620			
		0. 00	+ 0. 005			
		143. 90	13. 625			

 Σ 2924.

$$\alpha = 22^{\text{h}} 29^{\text{m}}.5 \quad \delta = 69^{\circ} 18' \quad (6 \text{ and } 8.)$$

1885. 846	21. 6	269. 2	0. 65	2	606	This star, discovered by the observers on the transit circle, proves to be Σ 2924.
5. 889	22. 1	88. 5	0. 66	3	606	
5. 922	22. 3	267. 3	0. 78	3	383	
1885. 886		268. 33	0. 697			Motion in angle.

Lalande 44276 = Σ 2928.

$$\alpha = 22^{\text{h}} 33^{\text{m}}.2 \quad \delta = -13^{\circ} 14' \quad (9 \text{ and } 9.2.)$$

1885. 717	21. 1	315. 9	4. 25	2	383	Motion.
5. 736	21. 0	133. 5	4. 24	2	383	
5. 739	21. 3	315. 8	4. 38	2	383	
1888. 833	22. 6	136. 3	4. 18	2	383	
8. 838	21. 7	136. 0	4. 08	3	383	
8. 849	23. 2	134. 4	4. 19	2	383	
1885. 731		315. 07	4. 290			
1888. 840		135. 57	4. 150			

 Σ 2934.

$$\alpha = 22^{\text{h}} 36^{\text{m}}.1 \quad \delta = 20^{\circ} 48' \quad (8 \text{ and } 9.)$$

1887. 932	22. 9	159. 0	0. 99	3	606	Motion in angle.
7. 937	23. 4	154. 5	1. 05	2	606	
7. 951	23. 3	155. 2	1. 00	3	606	
1887. 940		156. 23	1. 013			

OΣ 477.

$$a = 22\ 38^m.3 \quad \delta = 45^\circ\ 23' \quad (7 \text{ and } 11.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks.
1885.758	h. 20.6	° 164.9	'' 4.61	3	383	Motion in both coördinates.
5.766	20.2	164.2	4.63	2	383	
5.774	20.3	164.8	4.65	3	383	
1885.766		164.63	4.630			

Σ 2941.

$$a = 22^h\ 40^m.1 \quad \delta = 18^\circ\ 36' \quad (8 \text{ and } 10.)$$

1887. 842	22. 7	264. 5	10. 83	3	606	Motion.
7. 847	22. 6	264. 7	10. 97	2	383	
1887. 844	$\Delta \rho =$	264. 60	10. 900			
		0. 00	+ 0. 004			
		264. 60	10. 904			

Σ 2943.

$$a = 22^h\ 41^m.3 \quad \delta = -14^\circ\ 41' \quad (6 \text{ and } 9.)$$

1888.849	23.7	115.6	27.20	2	383	Motion.
8.852	21.9	115.1	27.46	2	383	
8.890	22.3	115.5	27.28	2	383	
1888.864	$\Delta \rho =$	115.40	27.313			
		+ 0.01	+ 0.011			
		115.41	27.324			

Bradley 3011. A and B.

$$a = 22^h\ 41^m.6 \quad \delta = -4^\circ\ 51' \quad (8 \text{ and } 8.)$$

1885.739	21.5	255.6	3.35	2	383	Motion.
5.747	20.5	255.4	3.42	2	383	
1885.743		255.50	3.385			

Bradley 3011. A and C.

1885.739	21.7	137.4	48.22	2	383
5.747	20.7	137.6	48.19	2	383
1883.743	$\Delta\rho =$	137.50	48.205		
		+ 0.01	+ 0.039		
		137.51	48.244		

Σ 2947.

$$\alpha = 22^{\text{h}} 44^{\text{m}}.9 \quad \delta = 67^{\circ} 56' \quad (7 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1889. 731	h. 20. 1	° 65. 8	'' 3. 69	3	606	
9. 745	20. 1	66. 5	3. 73	2	383	
9. 756	20. 3	67. 0	3. 63	2	383	
1889. 744		66. 43	3. 683			Motion in angle.

 Σ 2959.

$$\alpha = 22^{\text{h}} 50^{\text{m}}.6 \quad \delta = -3^{\circ} 53' \quad (6 \text{ and } 11.)$$

1888. 890	22. 6	103. 6	13. 45	2	383	A small companion 10'' following B.
8. 893	22. 3	103. 3	13. 48	3	383	
1888. 892	$\Delta \rho =$	103. 45	13. 465			Motion.
		0. 00	+ 0. 005			
		103. 45	13. 470			

 $O\Sigma$ 536.

$$\alpha = 22^{\text{h}} 52^{\text{m}}.6 \quad \delta = 8^{\circ} 44' \quad (8 \text{ and } 8.)$$

1882. 763	21. 6	167. 5	0. 24	2	888	
1890. 739	20. 2	139. 2	0. 31	3	888	Cloudy; a slight elongation only.
1891. 724	19. 9	144. 9	0. 27	2	888	Elongated only.
1. 733	19. 9	137. 9	0. 31	2	888	Observations doubtful.

 $O\Sigma$ 483.

$$\alpha = 22^{\text{h}} 53^{\text{m}}.2 \quad \delta = 11^{\circ} 5' \quad (6 \text{ and } 8.)$$

1885. 791	21. 4	217. 1	1. 09	2	606	
5. 796	20. 5	213. 4	1. 09	2	606	
5. 810	20. 9	211. 7	1. 03	2	383	
1888. 896	22. 5	213. 7	1. 06	2	606	
8. 931	22. 5	217. 9	1. 06	2	606	
1885. 799		214. 07	1. 070			Motion.
1888. 914		215. 80	1. 060			

 Σ 2977.

$$\alpha = 23^{\text{h}} 1^{\text{m}}.5 \quad \delta = 60^{\circ} 47' \quad (7 \text{ and } 11.)$$

1889. 778	19. 8	346. 0	2. 14	3	606	Companion is 13th mag.
9. 794	19. 9	347. 2	2. 13	3	606	
1889. 786		346. 60	2. 135			Motion in angle.

Σ 2976. *A* and *B*.

$a = 23^h\ 1^m.6$ $\delta = 5^\circ\ 57'$ (8 and 10.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887. 842	h. 22. 9	° 189. 7	" 17. 06	3	606	
7. 874	22. 7	189. 7	17. 13	2	383	
1887. 858	$\Delta \rho =$	189. 70	17. 095			
		0. 00	+ 0. 006			
		189. 70	17. 101			
						Motion.

Σ 2976. *A* and *C*. (8 and 10.)

1887. 842	23. 0	262. 0	8. 04	3	606	Blurred.
7. 874	22. 9	260. 1	7. 64	2	383	
7. 877	22. 0	261. 3	7. 91	3	383	
1887. 864		261. 34	7. 908			

Σ 2978.

$a = 23^h\ 1^m.7$ $\delta = 32^\circ\ 11'$ (7 and 8.)

1885. 758	21. 4	145. 8	8. 45	2	383	
5. 766	20. 8	144. 9	8. 61	2	383	
5. 774	20. 6	145. 4	8. 44	2	383	
1885. 766		145. 37	8. 500			
						No motion.

π Cephei = $O\Sigma$ 489.

$a = 23^h\ 4^m.1$ $\delta = 74^\circ\ 44'$ (5 and 10.)

1880. 044	2. 1	25. 2	1. 03	2	606	Images blurred. Images blurred. Blazing images.
0. 058	2. 0	25. 8	1. 16	2	606	
0. 063	2. 2	27. 4	1. 25	2	606	
0. 066	2. 5	26. 5	1. 24	2	606	
1885. 846	21. 9	29. 5	1. 23	2	606	
5. 889	22. 3	29. 5	1. 09	2	606	
5. 922	22. 5	22. 6	1. 19	2	383	
5. 933	22. 8	28. 6	1. 55	2	606	
1880. 056		25. 98	1. 145			Motion in angle.
1885. 893		27. 40	1. 224			

$O\Sigma$ 490.

$$\alpha = 23^{\text{h}} 4^{\text{m}}.9 \quad \delta = 66^{\circ} 47' \quad (7 \text{ and } 9.)$$

Date.	Sid. Time.	ρ	s	Wt.	Power.	Remarks
	h.	°	''			
1889.761	19.5	301.2	1.55	2	606	Faint.
9.764	19.3	302.1	1.56	2	606	Clouds.
1889.763		301.65	1.555			Perhaps motion in angle.

 Σ 2989.

$$\alpha = 23^{\text{h}} 7^{\text{m}}.2 \quad \delta = 19^{\circ} 20' \quad (9 \text{ and } 10.)$$

1884.928	23.2	140.1	1.57	3	383	
4.961	23.2	139.5	1.68	3	383	
1884.944		139.80	1.625			Motion doubtful.

 Σ 2998.

$$\alpha = 23^{\text{h}} 12^{\text{m}}.8 \quad \delta = -14^{\circ} 7' \quad (5 \text{ and } 7.)$$

1887.842	23.3	346.3	13.53	3	383	
7.874	23.2	346.9	13.55	2	383	
1887.858	$\Delta \rho =$	346.60	13.540			
		0.00	+ 0.008			
		346.60	13.548			Motion doubtful.

 Σ 3001.

$$\alpha = 23^{\text{h}} 13^{\text{m}}.7 \quad \delta = 67^{\circ} 27' \quad (6 \text{ and } 8.)$$

1885.846	22.5	194.0	2.80	2	383	
5.889	22.6	196.3	2.76	2	383	Clouds.
5.922	22.7	194.7	2.70	2	383	
1885.886		195.00	2.753			Motion.

 Σ 3006.

$$\alpha = 23^{\text{h}} 15^{\text{m}}.4 \quad \delta = 34^{\circ} 47' \quad (8 \text{ and } 9.)$$

1885.947	23.2	169.3	5.38	3	383	Clouds.
5.950	23.9	170.9	5.51	3	383	
1885.948		170.10	5.445			A slow motion.

Σ 3008.

$$a = 23^{\text{h}} 17^{\text{m}}.5 \quad \delta = -9^{\circ} 7' \quad (7 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1884.928	h. 23.4	° 251.4	// 4.64	3	383	Motion.
4.961	23.4	252.2	4.64	3	383	
1884.944		252.30	4.640			

 $O\Sigma$ 500.

$$a = 23^{\text{h}} 31^{\text{m}}.7 \quad \delta = 43^{\circ} 46' \quad (6 \text{ and } 7.)$$

1888.893	22.5	322.7	0.49	3	606	A slow motion.
8.896	22.3	321.3	0.54	2	606	
8.937	22.6	323.9	0.48	3	606	
1888.909		322.63	0.503			

 Σ 3028.

$$a = 23^{\text{h}} 32^{\text{m}}.6 \quad \delta = 34^{\circ} 23' \quad (7 \text{ and } 10.)$$

1887.913	23.4	203.1	17.93	3	383	Motion doubtful.
7.916	22.7	203.1	17.97	2	383	
1887.914	$\Delta p =$	203.10	17.950			
		0.00	+ 0.005			
		203.10	17.955			

 i^2 Aquarii.

$$a = 23^{\text{h}} 39^{\text{m}}.8 \quad \delta = -19^{\circ} 21' \quad (6 \text{ and } 8.)$$

1887.877	23.6	138.7	5.85	3	383	Motion.
7.880	23.9	135.7	6.01	2	383	
7.913	23.6	136.1	5.81	2	383	
7.916	22.9	140.5	6.00	2	383	
1887.897		137.75	5.918			

 Σ 3041. A and $\frac{BC}{2}$.

$$a = 23^{\text{h}} 41^{\text{m}}.8 \quad \delta = 16^{\circ} 25' \quad (7 \text{ and } 8.)$$

1887.877	23.9	350.4	67.29	3	383	
7.880	23.5	350.6	67.24	2	383	
1887.878	$\Delta p =$	350.50	67.265			
		0.00	+ 0.020			
		350.50	67.285			

Σ 3041. *B* and *C*. (8 and 8.)

Date.	Sid. Time.	<i>p</i>	<i>s</i>	Wt.	Power.	Remarks.
1887.877	h. 0.2	° 1.5	" 3.19	3	383	A slow motion.
7.880	23.6	1.5	3.13	2	383	
1887.878		1.50	3.160			

 Σ 3047. *A* and *B*. $\alpha = 23^{\text{h}} 51^{\text{m}}.8$ $\delta = 56^{\circ} 43'$ (9 and 9.)

1886.908	23.2	71.7	0.91	3	606	Motion doubtful.
6.911	22.7	68.6	1.02	2	606	
6.913	22.3	67.7	1.03	2	606	
1886.911		69.33	0.987			

 $O\Sigma$ 3047. $\frac{A+B}{2}$ and *C*.

1886.908	23.4	193.7	8.42	3	606	
6.911	22.9	192.8	8.12	2	606	
1886.910		193.25	8.270			

 $O\Sigma$ 513. $\alpha = 23^{\text{h}} 52^{\text{m}}.2$ $\delta = 34^{\circ} 22'$ (7 and 10.)

1885.758	21.7	24.8	3.56	3	383	No motion.
5.766	21.1	25.7	3.69	2	383	
5.774	21.1	23.6	3.72	3	383	
1885.766		24.70	3.657			

 σ Cassiopeæ. $\alpha = 23^{\text{h}} 52^{\text{m}}.9$ $\delta = 55^{\circ} 5'$ (5 and 7.)

1886.905	23.3	322.6	2.89	2	383	No motion.
6.908	23.7	327.8	3.06	2	606	
6.911	23.4	322.3	3.08	2	606	
1886.908		324.23	3.010			

Σ 3050.

$$\alpha = 23^{\text{h}} 53^{\text{m}}.4 \quad \delta = 33^{\circ} 4' \quad (6 \text{ and } 7.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
1887.916	h. 23.1	° 206.8	// 2.76	3	383	Motion in angle and distance.
7.918	22.7	206.9	2.79	3	383	
1887.917		206.85	2.775			

85 Pegasi.

$$\alpha = 23^{\text{h}} 55^{\text{m}}.9 \quad \delta = 26^{\circ} 27' \quad (6 \text{ and } 12.)$$

1880.778	23.5	300.8	0.62	3	888	
0.781	23.2	296.6	0.71	3	888	
0.819	23.9	294.2	. .	2	888	
1886.840	0.2	109.1	0.70	3	888	
6.938	23.0	109.6	0.82	3	606	
6.944	22.7	110.4	0.86	3	606	
1888.937	22.9	123.4	0.75	2	606	
8.959	22.9	122.6	0.77	3	606	
8.972	23.3	126.4	0.98	2	606	
1880.793		297.20	0.665			
1886.907		109.70	0.793			
1888.956		124.13	0.833			

 Σ 3056. A and B.

$$\alpha = 23 \quad 58^{\text{m}}.5 \quad \delta = 33^{\circ} 35' \quad (7 \text{ and } 8.)$$

1887.916	23.3	153.0	0.54	2	606	Motion doubtful.
7.918	23.0	151.2	0.53	2	606	
1887.917		152.10	0.535			

 Σ 3056. $\frac{A+B}{2}$ and C. (7 and 9.)

1887.916	23.5	357.6	22.15	2	606	
7.918	23.2	357.5	22.23	2	606	
1887.917	$\Delta p =$	357.55	22.190			
		0.00	+ 0.005			
		357.55	22.195			

$O\Sigma$ 547.

$$\alpha = 23^{\text{h}} 59^{\text{m}}.2 \quad \delta = 45^{\circ} 9' \quad (8 \text{ and } 8.)$$

Date.	Sid. Time.	p	s	Wt.	Power.	Remarks.
	h.	$^{\circ}$	$''$			
1885. 758	21. 9	341. 7	4. 02	3	383	Very faint; clouds.
5. 766	21. 4	340. 4	4. 03	2	383	
5. 774	21. 3	340. 4	4. 18	3	383	
1891. 724	19. 6	340. 7	4. 31	3	383	9th and 10th magnitudes.
1. 727	19. 8	340. 8	4. 28	2	383	
1885. 766		340. 83	4. 077			
1891. 725		340. 75	4. 295			

 Σ 3060.

$$\alpha = 23^{\text{h}} 59^{\text{m}}.5 \quad \delta = 17^{\circ} 25' \quad (8 \text{ and } 9.)$$

1884. 928	23. 8	118. 5	3. 62	3	383	Motion in angle.
4. 961	23. 9	118. 0	3. 46	2	383	
1884. 944		118. 25	3. 540			

 Σ 3061.

$$\alpha = 23^{\text{h}} 59^{\text{m}}.5 \quad \delta = 17^{\circ} 10' \quad (8 \text{ and } 8.)$$

1884. 928	0. 1	147. 4	7. 70	3	383	Telescope shaken by wind.
4. 961	23. 7	146. 4	7. 93	2	383	
1884. 944		146. 90	7. 815			No motion.

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APPENDIX 2

MAGNETIC OBSERVATIONS

AT THE

UNITED STATES NAVAL OBSERVATORY

1891

BY

J. A. HOOGEWERFF, ENSIGN U. S. NAVY

Capt. F. V. McNAIR, U. S. Navy
Superintendent

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F. 3

INTRODUCTION

The magnetic work for the year 1891 is prepared on the same general plan as that for 1889-90, published as Appendix I to the Washington Observations for 1886, and Appendix 2, 1887.

The mean declination values for 1891 given in Tables I and II were taken from the means found in Table V, and not from the monthly composite curves as was done for the years 1888-89. When a sufficient number of years' observations have been made it is proposed, in working up the results for the period, to substitute, for the declination values for 1888-89 obtained from the composite curves, mean values from Table V for those years.

The observations for 1891 show an improvement over those for former years, which is chiefly due to my having been able to reduce the observations from time to time; and, from the experience so obtained, to correct and guard against conditions which tended to cause errors and uncertainties in them. The observations for 1888-89, owing to want of force in the office, had been accumulating for sometime before reduction, and the observers generally were not able to profit by the experience gained from the reductions.

The formulæ used in the reduction of the absolute observations of horizontal intensity are given, and also the coefficients, etc., of the instrument, so that it is possible to follow the work through.

The ordinates of the magnetograph traces corresponding to the observations for horizontal intensity and dip are also given, together with the temperatures of the instruments.

The corrections for temperature, and for change of force corresponding to change of ordinate were obtained by two or more methods, and the results believed to be most accurate were used in the reductions.

BUILDINGS

The magnetic instruments in use at the Naval Observatory are set up in two buildings, which were erected for the purpose by the Bureau of Navigation, Navy Department, in 1886-87, and which were assigned to the Observatory in July, 1887.

The idea of the magnetic observatory originated with Lieut. Commander (now Commander) T. A. LYONS, U. S. Navy, and the designs for the buildings were drawn according to his views. Lieut. Commander LYONS also fixed upon the number, kind, and location of the instruments, and left complete and detailed drawings and descrip-

tions of everything pertaining to them. The buildings were constructed and the piers, etc., for the instruments were set up under the supervision of Lieuts. C. C. CORNWELL and S. W. B. DIEHL, U. S. Navy, while Lieut. H. W. SCHAEFER, who was later assisted by Lieut. W. P. ELLIOTT, put the instruments in working order and commenced the observations.

The buildings are 100 feet west of the main Observatory building and 50 feet apart on a north and south line.

The northern building, which is known as No. 1, is a one-story wooden structure, 37 feet 6 inches by 21 feet 6 inches, the length being north and south. In this building are set up the instruments for absolute observations.

The southern building, known as No. 2, is 25 feet 7 inches by 19 feet 7 inches, and consists of an underground basement, with a single-story building of wood above it. The basement is of brick, with cemented floor, the ground underneath which, and around the walls, being thoroughly drained, the interior is kept very dry. Inside the basement and 22 inches from the walls is a wooden cell of double thickness and with a double ceiling, the upper planking of which forms the floor of the building above.

On three sides the space between the brick walls and inner cell is carried up, with double thickness of wood, about 2 feet, forming a transom or bench around the sides of the building above and giving room for six small windows, with solid wooden shutters on the outer sides, just above the level of the surrounding ground. On the fourth side is a stairway, opening into the room above. There are six windows and a door in the wooden cell, which open into the space between it and the walls. All of these windows are kept closed to exclude dampness and to keep the temperature as nearly constant as possible. Inside the inner cell of this basement are set up the self-registering magnetographs, while a portion of the space between it and the walls is utilized for a seismoscope and seismograph. There is a copper pipe, with branches opening over each of the lights used for the magnetographs, which carries off the hot air from them into the outside air, and which in that way helps to ventilate the room. The wooden building over this basement consists of an office room and a dark room for photography, etc.

In building both buildings, Nos. 1 and 2, great care was taken to exclude all magnetic material, the fastenings, etc., being entirely of copper, brass, or wood; no iron being used in any form.

The stoves in the wooden buildings are of soapstone, with copper pipes, and wood only is burned in them. There is no provision made for heating or cooling the basement cell.

INSTRUMENTS

In building No. 1 are five piers, which are based on concrete and separated entirely from the floor of the building. Three of these piers are in a north and south (magnetic) line, near the west wall of the building. The northern and southern piers are at equal distances from the middle one. The southern pier is of granite, and on it is set up a large declinometer. On the middle pier, which is of brick with granite slab, is a large theodolite. On the northern pier is an arrangement for testing compasses,

The *declinometer* is a magnet 12 inches by $1\frac{1}{4}$ by 0.2 inches, hung inside a box of brass and glass by a silk suspension from a torsion circle on top of a large glass tube 60 inches high. The suspension is fastened to the magnet by a stud on a German-silver strap which encircles the magnet. The strap is provided with a stud on the opposite side, so that the magnet can be turned over. The magnet is fitted with a sliding weight, counterpoise, and levels. On the north end of the magnet is a small plane mirror, which can be accurately adjusted. The magnet is surrounded by a pure copper damper. A detorsion bar is also provided. The declinometer was made by Fauth & Co., of Washington, with great care.

The *theodolite* on the middle pier has a horizontal circle of 10 inches diameter, and can be read by means of two micrometers to seconds. It is mounted on a block, which travels on rails on a second block, which is secured to the pier cap. The block carrying the theodolite can be moved in an east and west direction by means of a large screw. On the south side of the pier, just above the floor, is a curved scale, the radius of which is the distance from the declinometer to the scale. It is provided with adjusting screws and levels. On the block carrying the theodolite is a frame so arranged that a plumb-bob can be hung just in front of the object glass of the telescope. The point of suspension of the plumb-bob is capable of a small movement by means of a screw.

The *compass-testing stand* is on the north pier on a block arranged similarly to that of the theodolite, so as to be capable of motion in an east and west direction. On the movable block are screwed two Y's, which hold the compass to be tested. Over the center of the compass are two prisms attached to the arm of an upright. These prisms are capable of adjustment, so that the opposite marks of the compass card in line with the theodolite can be seen when the theodolite is directed on the prisms.

The other two piers in this building are of oak and are in the northeast part of the building, well removed from the declinometer.

On one of these piers is set up a portable magnetometer, by Elliott Brothers, London, and which is their usual pattern. On the other pier is a dip circle made by Kent, of Dover.

Magnetographs.—In the basement of building No. 2 is a set of Kew self-recording magnetographs, by Adie. These instruments are set on granite piers, and, besides the self-recording arrangement, have telescopes and scales set on stone piers, by means of which the positions of the magnets can be read at any time.

A *seismoscope and seismograph*, the former of the Mendenhall pattern and the latter of the Lick Observatory pattern, are set on the cement floor (which is very solid) in the space between the basement wall and inner cell. A second seismoscope is set up on a brick pier in a small building, which is at some distance from the magnetograph building. Both seismoscopes are electrically connected to clocks in the upper part of building No. 2, in such a way that when they fall the corresponding clock is stopped.

OBSERVATIONS

Absolute.—The absolute observations taken are for declination (variation of the compass), horizontal force, and inclination (dip).

Declination.—The declination is determined by the old method of Gauss, as follows: In the first place, the errors of collimation, etc., are found for all the different foci used, and all observations are made with the telescope in its usual position and also inverted in the Y's, so as to eliminate all errors of the instrument as much as possible. The wire in the eyepiece is adjusted so that there is no correction for collimation when the telescope is directed on the mirror on the magnet and focused so that the scale can be read plainly.

The reading of the horizontal circle, when the line of sight is in the meridian, is found from star observations, which are taken whenever there is reason to believe that the instrument has altered its position. When an azimuth is taken the azimuth of 2 fixed marks are observed and used as a check on the position of the theodolite. The *line of sight* of the telescope is then directed on the suspension thread of the magnet and the telescope lowered on to the mirror and focused so that the scale can be read. The magnet is then chocked (care being taken that the suspension thread is not deflected from its normal position) so that the same division of the scale is seen on the eye-wire with the telescope in its usual position and inverted. The plumb-bob in front of the object-glass is now adjusted so that the image of the same division of the scale and the image of the plumb-line when it crosses the scale are seen on the eye-wire with the telescope in its usual position and inverted. This is accomplished when the plumb-line crosses the line of sight and the plane of the mirror is perpendicular to the plane of the line of sight and the plumb-wire, and to get the adjustment the magnet must be chocked so that the mirror is in the proper plane, and the plumb-bob moved until its wire crosses the line of sight. This is done by successive approximations, and requires two observers. When the adjustment is completed the reading of the scale crossed by the plumb-line and by the eye-wire is the zero mark of the scale. A time is selected when there is little or no change in declination and no disturbances are in progress, and these readings taken with the magnet in its usual position and reversed, and from these is found the error of the magnet for inversion. These corrections are determined at intervals never more than three months.

After determining all corrections the telescope is directed on the suspension and the horizontal circle clamped. The telescope is then lowered on to the mirror and clamped there, and focused till the scale can be read. The instrument is not disturbed in any way now until it is thought necessary to get a new set of determinations. The reading of the reflected scale where it crosses the vertical wire of the telescope is taken twice a day, and also the time, both of which are recorded in a book kept for the purpose. From these observations the declination is found at two moments of each day.

Horizontal force.—Previous to April, 1890, it had been the practice to make a single observation of horizontal force on Tuesday of each week, but since that time observations have been made on two successive days, at intervals of two weeks. In the vibration experiment every ninth passage of the needle is recorded up to and including the ninety-ninth, after which the observer waits for the one hundred and

eightieth passage and records each ninth passage to the two hundred and seventy-ninth. The difference of the times of the passages differing 180 from each other are taken, and the mean of these divided by 180 is taken as the time of vibration. This is really the mean of 2,160 vibrations. Immediately after observing the vibrations the observation to determine the effect of the torsion is taken, the torsion circle being turned through $+90^\circ$, -90° , $+362^\circ$, and -360° , the mean position of the magnet being noted when the torsion circle reads 0, $+90^\circ$, 0, -90° , 0, $+360^\circ$, 0, -360° , and 0. From these observations the effect of torsion for 90° is computed. In the deflection experiment the method of sines is used, and the deflecting magnet is placed successively at distances of .3 and .4 metre from the deflected magnet on both sides, and with its north pole toward and from the deflected magnet in each position. The same mark of the scale (reflected by the mirror on the deflected magnet) is brought to the wire in the telescope by turning the horizontal circle, and both verniers read and recorded for each position. The temperature of the magnet and of the bar is observed and recorded during both observations. At least once each month the vibration experiment is made with the inertia cylinder attached.

The formulæ used in the reduction of the observations for horizontal intensity made with magnetometer No. 42 (Elliott Brothers) were taken from the Bombay Observations, 1865-70, and are as follows:

$$(mX) = mX \left(1 - \frac{dX}{2X} \right) = A \frac{1+a}{T_0^2}$$

$$\left(\frac{m}{X} \right) = \frac{m}{X} \left(1 - \frac{dX}{2X} \right) = B(1+b) \sin u$$

$$X^2 = (mX) \div \left(\frac{m}{X} \right) = A \frac{1+a}{T_0^2} \cdot \frac{1}{B(1+b) \sin u}$$

$$m^2 \left(1 - \frac{dX}{X} \right) = (mX) \left(\frac{m}{X} \right) = A \frac{1+a}{T_0^2} \cdot B(1+b) \sin u$$

$$m^2 = \left(A \frac{1+a}{T_0^2} \right) \{ B(1+b) \sin u \} \left(1 + \frac{dX}{X} \right)$$

where

$$a = (q + 2\varepsilon')(t_v - t) - \frac{H}{F} - \mu \div \left(\frac{m}{X} \right)_0 + \frac{2s}{86400}$$

$$b = (q + 3\varepsilon)(t_d - t)$$

$$A = \pi^2 K' \{ 1 + [a]^2 \}$$

$$B = \frac{r_1^3 \{ 1 + [b]^2 \}}{2 \left\{ 1 - \frac{2\mu}{r_0^3} + \frac{P}{r_0^2} \right\}}$$

m = magnetic moment of the deflecting or vibrating magnet 42A at temperature 0° centigrade.

$m \{1 - q(t_0 - 0) - q'(t_0 - 0)^2\}$ = magnetic moment of the deflecting or vibrating magnet 42 A at temp. t_0 , where $q = 0.0004788$ and $q' = 0.00000104$.

X = horizontal component of the earth's magnetic force, or the mean of its values during the vibration and deflection experiments in C. G. S. units.

dX = the excess of the mean value of the horizontal force during the deflection experiment above its mean value during the vibration experiment.

T_0 = observed time of one vibration of magnet 42A.

ε' = the linear coefficient of expansion of steel, the adopted value of which is 0.000012.

t_v = mean reading of thermometer in vibration experiment.

t_d = mean reading of thermometer in deflection experiment.

$t = 0^\circ$ centigrade.

$\frac{H}{F}$ = ratio of the force of torsion of the suspending thread of the vibration magnet to the magnetic direction force.

μ = the increase in the magnetic moment of the magnet 42A produced by the inducing action of a magnetic force equal to unity of the C. G. S. system of absolute measurement.

s = daily rate of chronometer, + when gaining, - when losing.

r_0 = the distance, read on brass deflection bar between the centers of the deflecting and suspended magnets in the observation of the deflection.

r_1 = the distance r_0 corrected for error of graduation and reduced to temperature 0° centigrade.

u = observed angle of deflection when $r_0 = 0.3$ metre.

u' = observed angle of deflection when $r_0 = 0.4$ metre.

ε = the linear coefficient of expansion of brass, the adopted value of which is 0.000018.

$\pi = 3.1415927$.

K' = moment of inertia of magnet 42A with appendages at temperature 0° centigrade.

$[a]$ = the mean value of $a = \left[(q + 2\varepsilon')t_v - \frac{H}{F} - \mu \div \left(\frac{m}{X} \right)_0 + \frac{2s}{86400} \right]$ for the series of observations.

$[b]$ = the mean value of $b = [(q + 3\varepsilon)t_d]$

P = a constant correction which depends on the distribution of magnetism in the deflecting and deflected magnets

$$= \frac{\frac{1}{2}(r')^3 \sin u \left\{ 1 + \frac{2\mu}{(r')^3} + q(t_0 - t) \right\}}{(r')^2} - \frac{\frac{1}{2}(r'')^3 \sin u' \left\{ 1 + \frac{2\mu}{(r'')^3} + q(t_0 - t) \right\}}{(r'')^2}$$

where $r' = 0.3$ metre and $r'' = 0.4$ metre distance of deflecting and deflected magnets as read on bar.

$$\left(\frac{m}{X}\right)_0 = \frac{r_1^3 \{1 + 3\varepsilon([t_a] - t)\}}{2(1 + P - 2\mu)} \sin u, \text{ or the mean of two values of this where } [t_a] =$$

mean temperature of the series, and $r_0 = 0.3$ metre and 0.4 metre, respectively.

$q(t_v - t)$ must be understood to include $\{q(t_v - t) + q'(t_v - t)^2\}$ and similarly for $q(t_a - t)$.

The following constants were furnished from Kew :

$$r_1 = r_0 \{1 + 0.000018(t_0 - 0^\circ) \text{ Cent.}\} + \text{correction for scale error.}$$

$$\left. \begin{array}{l} \text{Correction at } 0.20 \text{ metre} = + 0.00010 \text{ metre} \\ \text{Correction at } 0.50 \text{ metre} = + 0.00015 \text{ metre} \end{array} \right\} \text{at } 0^\circ \text{ Centigrade.}$$

Deflection apparatus, angular value of one scale division $= 60''.8$. When the scale reading is above the middle point of the scale, the correction to the circle reading is additive, and when below, it is subtractive.

Vibration magnet (42A), angular value of one scale division $= 1'.84$.

For deflecting magnet (42A), correction to 0° centigrade $= 0.0004788(t_0 - 0^\circ) + 0.00000104(t_0 - 0^\circ)^2$.

Induction coefficient $\mu = 0.00000613$

$K = W \left(\frac{l^2}{12} + \frac{d^2}{16} \right) \frac{t^2}{t'^2 - t^2}$ where W = weight of cylinder in grammes, l and d its length and diameter expressed in centimetres, t' and t being the times of vibration (corrected for torsion, temperature, etc.) of the magnet with and without the additional weight of the cylinder.

Dimension of cylinder:

$$\begin{aligned} l &= 0.096595 \text{ metre} \\ d &= 0.010022 \text{ metre} \\ W &= 64.2854 \text{ grammes} \end{aligned}$$

$\log \pi^2 K$ at 0° Centigrade $= 9.44895$, but value obtained here and used is $\log \pi^2 K$ at 0° centigrade $= 9.44854$.

No correction was applied for different initial and terminal arcs of vibration, they being always very small.

Temperature Correction for the Magnet 42A

Temp. = t_0	Correction to 0° Centigrade	Temp. = t_0	Correction to 0° Centigrade	Temp. = t_0	Correction to 0° Centigrade
0		0		0	
— 5	— 0.00237	11	+ 0.00540	26	+ 0.01316
4	189	12	590	27	1369
3	142	13	641	28	1423
2	95	14	691	29	1476
— 1	— 0.00047	15	742	30	1530
0	0.00000	16	793	31	1585
+ 1	+ 0.00048	17	845	32	1639
2	97	18	896	33	1694
3	145	19	948	34	1749
4	194	20	999	35	1803
5	242	21	0.01052	36	1859
6	291	22	1104	37	1915
7	341	23	1157	38	1970
8	390	24	1209	39	2026
9	440	25	+ 0.01262	40	+ 0.02082
10	+ 0.00489				

Values of $\log \pi^2 K$ and of $\log \frac{1}{2} r^3$ for Different Temperatures

Temp. Centi- grade	Log $\pi^2 K$ *	Log $\frac{1}{2} r^3$				
		Metre $r_0 = 0.250$	Metre $r_0 = 0.300$	Metre $r_0 = 0.350$	Metre $r_0 = 0.400$	Metre $r_0 = 0.450$
0						
0	9.44854	7.89227	8.12990	8.33071	8.50474	8.65817
+ 5	.44859	.89231	.12994	.33075	.50478	.65821
10	.44865	.89235	.12998	.33079	.50482	.65825
15	.44870	.89238	.13001	.33082	.50486	.65829
20	.44876	.89242	.13005	.33086	.50490	.65833
25	.44881	.89246	.13009	.33090	.50494	.65837
30	.44887	.89250	.13013	.33094	.50498	.65841
35	.44892	.89254	.13017	.33098	.50501	.65845
+ 40	9.44898	7.89258	8.13021	8.33102	8.50505	8.65849

* These values are one 0.00041 less than those furnished at Kew.

The following table of the values of $\frac{2s}{86400}$ was made here :

Daily Rate	$\frac{2s}{86400}$	Daily Rate	$\frac{2s}{86400}$	Daily Rate	$\frac{2s}{86400}$
s		s		s	
0.1	.0000023	1.1	.0000254	2.1	.0000486
0.2	46	1.2	277	2.2	509
0.3	69	1.3	300	2.3	532
0.4	92	1.4	323	2.4	555
0.5	115	1.5	347	2.5	578
0.6	138	1.6	370	2.6	601
0.7	161	1.7	393	2.7	624
0.8	184	1.8	416	2.8	647
0.9	207	1.9	439	2.9	671
1.0	.0000230	2.0	.0000463	3.0	.0000694

Value of $\frac{H}{F}$ for Different Values of the Deflection Produced by a Twist of 90° of the Suspension Thread

Effect of 90° of Torsion	$\frac{H}{F}$	Effect of 90° of Torsion	$\frac{H}{F}$	Effect of 90° of Torsion	$\frac{H}{F}$
/		/		/	
1	.00019	6	.00111	11	.00204
2	.00037	7	.00130	12	.00223
3	.00056	8	.00148	13	.00241
4	.00074	9	.00167	14	.00260
5	.00093	10	.00185	15	.00278

Values of $1 + \frac{2\mu}{r_0^3}$ for Different Distances

Distance	$1 + \frac{2\mu}{r_0^3}$
<i>Metre</i>	
0.250	1.00079
0.300	1.00046
0.350	1.00029
0.400	1.00019
0.450	1.00013

As all the temperatures given are corrected for errors of thermometers it is not necessary to give these errors, which are small.

The observations for the year were divided into three series, namely, (1) from January 1 to March 31; (2) from April 1 to September 30, and (3) from October 1 to December 31.

The series were formed in this way in order to have the range of temperature for them within as small limits as practicable.

Dip.—It had been the practice to make observations with the dip circle between 9 and 11 a. m. and 2 and 4 p. m. on Mondays and Fridays of each week; but since April, 1890, an observation for dip has been taken immediately before and after each observation for horizontal force. Two needles are used in rotation.

Magnetographs.—A continuous photographic record is kept of the changes of position of the magnetograph magnets, except for a few minutes each day, between 12:20 and 12:30 p. m., when the papers are changed or slits moved. Usually 2 days' records are kept on each sheet. The papers are developed every few days and the ordinates measured for each hour and recorded. The temperature of the magnets is taken and recorded every 3 hours. Eye observations are taken and the temperatures recorded whenever an observation of horizontal force or dip is made.

At least once in 3 months observations are taken to determine the change in force, represented by a change of 1^{mm} on paper and of 1 scale division of the eye-reading scales for the horizontal and vertical force magnetographs. The temperature corrections used were found by comparing the mean measurements of the traces with the corresponding mean temperatures for a large number of days in such a way that the daily loss of magnetism of the magnets was eliminated.

Seismoscopes.—The clocks connected with the seismoscopes are frequently compared and their errors and rates recorded, and the seismoscopes are examined and dropped occasionally to see that they are in order.

Seismograph.—This instrument is examined from time to time and kept in good working order.

Up to the present time there has been no earthquake shock since setting up these instruments.

Occasional observations.—Occasional observations are made when possible with different instruments, in order to check the regular observations, and the temperature coefficients, etc., furnished at Kew.

REDUCTION OF OBSERVATIONS

Declination.—The ordinate on the photographic trace of declination corresponding to the time when the absolute declination is taken is measured with a scale whose divisions are equal to minutes of arc of the movement of the magnet. On this scale $8.86^{\text{mm}} = 10'$ arc. This ordinate subtracted from the true declination, as determined by the large declinometer and theodolite, gives the value of the base line. Two values are thus obtained for each day, and the mean of these for the month is taken as the base line value for that month.

Horizontal force.—The ordinates of the photographic traces for each day are measured at each hour and recorded. The proper temperature correction is then applied to each ordinate to reduce all the ordinates for a month to the same temperature. The ordinates (reduced to this temperature) corresponding to the times when the absolute horizontal intensity was observed during the month are then taken and placed opposite their corresponding absolute force. From them is deduced the ordinate which on

the first of the month corresponds to a given force. From this as a base, with the change in ordinate corresponding to change in force, is constructed a table for the month, and with it all the ordinates (corrected for temperature) are converted into terms of absolute force. The change in ordinate from the first of one month to the first of the next month, due to loss of magnetism of the magnet, is then found, and the proper correction for it applied to all the results.

In the horizontal-force traces an increase of temperature causes a decrease in the ordinate, and increasing ordinates (corrected for temperature changes) denote increasing force. The following is the history of the magnets used in the horizontal-force magnetograph, and the value of 1^{mm} change of ordinate in terms of force during the year 1891.

January 1.—The magnet (A) was readjusted and records commenced. This magnet was not disturbed until December 18, when it was accidentally jarred in some way not known, which altered the distance of the trace from the base line, but did not affect the constants of the instrument.

Experiments made to determine the value of 1^{mm} of ordinate in terms of force, 1891:

January	21, $+ 1^{\text{mm}} = + 0.0000446$ C. G. S. units.	(A)
March	2, $+ 1^{\text{mm}} = + 0.0000453$ C. G. S. units.	(A)
October	21, $+ 1^{\text{mm}} = + 0.0000456$ C. G. S. units.	(A)
December	18, accidentally jarred.	
December	22, $+ 1^{\text{mm}} = + 0.0000453$ C. G. S. units.	(A)

The factor used for the year for turning scale readings made with the eye-reading telescope into ordinates, as measured on the photographic traces, was

$$1^{\text{cm}} \text{ scale} = 14.25^{\text{mm}} \text{ ordinate of trace}$$

The values used in reducing the ordinates of the traces were as follows:

For change of temperature:

January, February, and March	$+ 1^{\circ} \text{ C.} = - 1.00^{\text{mm}}$ change of ordinate
April, May, and June	$+ 1^{\circ} \text{ C.} = - 1.25^{\text{mm}}$ change of ordinate
July, August, and September	$+ 1^{\circ} \text{ C.} = - 1.00^{\text{mm}}$ change of ordinate
October, November, and December	$+ 1^{\circ} \text{ C.} = - 1.22^{\text{mm}}$ change of ordinate

For change of force:

Whole year $+ 1^{\text{mm}}$ change in ordinate $= + 0.000045$ C. G. S. units.

For *decrease* in ordinate due to gradual loss of magnetism by magnet in time.

January, February, and March	$= 0.11807^{\text{mm}}$	<i>decrease of ordinate per day</i>
April, May, and June	$= 0.1^{\text{mm}}$	<i>decrease of ordinate per day</i>
July and August	$= 0.4^{\text{mm}}$	<i>decrease of ordinate per day</i>
September	$= 0.375^{\text{mm}}$	<i>decrease of ordinate per day</i>
October	$= 0.3667^{\text{mm}}$	<i>decrease of ordinate per day</i>
November	$= 0.1711^{\text{mm}}$	<i>decrease of ordinate per day</i>
December	$= 0.131^{\text{mm}}$	<i>decrease of ordinate per day</i>

This correction seems to be dependent on the mean temperature of the magnet for the period, and increased rapidly for high temperatures.

The bases of reduction of the traces for each month derived from the absolute observations were :

January	1, 80.0 ^{mm} at 18° C. = 0.198221 C. G. S. units
February	1, 80.0 ^{mm} at 18° C. = 0.198392 C. G. S. units
March	1, 80.0 ^{mm} at 18° C. = 0.198540 C. G. S. units
April	1, 70.0 ^{mm} at 24° C. = 0.198466 C. G. S. units
May	1, 70.0 ^{mm} at 24° C. = 0.198601 C. G. S. units
June	1, 70.0 ^{mm} at 24° C. = 0.198740 C. G. S. units
July	1, 50.0 ^{mm} at 31° C. = 0.198333 C. G. S. units
August	1, 30.0 ^{mm} at 31° C. = 0.197993 C. G. S. units
September	1, 20.0 ^{mm} at 31° C. = 0.198102 C. G. S. units
October	1, 20.0 ^{mm} at 26° C. = 0.198335 C. G. S. units
November	4, 15.0 ^{mm} at 26° C. = 0.198671 C. G. S. units
December	1, 10.0 ^{mm} at 23° C. = 0.198471 C. G. S. units
December	23, 23.0 ^{mm} at 23° C. = 0.198181 C. G. S. units

The temperatures given were approximately the mean temperatures for the month, and all the ordinates for the month were reduced to those temperatures.

Vertical force.—The ordinates of the vertical-force traces were measured, recorded, and corrected for temperature in the same manner as those of the horizontal-force traces. The absolute vertical force and the corresponding ordinate were then found, the former from the dip observations and the horizontal force at the middle of the corresponding dip observation, the latter from the ordinate corresponding to the middle time of the dip observation reduced to the temperature to which all the ordinates for the month were reduced. The conversion into absolute force was then done in a similar manner to that used for the horizontal-force ordinates, and the correction for loss of magnetism found and applied in a similar way also.

In the vertical-force traces increase of ordinate denotes decreasing force, and an increase in temperature causes an increase in the ordinate.

The following is the history of the vertical-force magnetograph during 1891:

January 1. Adjusted.

April 29. Readjusted, the magnet having upset, south end falling.

October 10. Readjusted.

November 4. Readjusted, the magnet having upset, north end falling, while repairing clockwork.

Observations made to determine the value of 1^{mm} of ordinate in terms of force, 1891:

January	21, + 1 ^{mm} = - 0.0000839 C. G. S. units
May	9, + 1 ^{mm} = - 0.0000719 C. G. S. units
September	1, + 1 ^{mm} = - 0.0000804 C. G. S. units
October	24, + 1 ^{mm} = - 0.0000522 C. G. S. units
November	20, + 1 ^{mm} = - 0.0000792 C. G. S. units
December	22, + 1 ^{mm} = - 0.0000845 C. G. S. units

The factor used for the year for turning scale readings made with the eye-reading telescope into ordinates as measured on the photographic traces was :

$$1^{\text{cm}} \text{ scale} = 8.73^{\text{mm}} \text{ ordinate of trace}$$

The values used in reducing the ordinates of the traces were as follows :

For change of temperature—

January, February, March, and April	$+ 1^{\circ} \text{C.} = + 4.4^{\text{mm}}$	change of ordinate
May, June, July, and August	$+ 1^{\circ} \text{C.} = + 2.0^{\text{mm}}$	change of ordinate
September	$+ 1^{\circ} \text{C.} = + 1.50^{\text{mm}}$	change of ordinate
October (after October 10)	$+ 1^{\circ} \text{C.} = + 2.00^{\text{mm}}$	change of ordinate
November (after November 4)	$+ 1^{\circ} \text{C.} = + 2.232^{\text{mm}}$	change of ordinate
December	$+ 1^{\circ} \text{C.} = + 2.00^{\text{mm}}$	change of ordinate

For change of force—

January, February, March, and April	$+ 1^{\text{mm}} = - 0.000085$	C. G. S. units
May, June, July, and August	$+ 1^{\text{mm}} = - 0.000075$	C. G. S. units
September	$+ 1^{\text{mm}} = - 0.000080$	C. G. S. units
October (after October 10)	$+ 1^{\text{mm}} = - 0.000052$	C. G. S. units
November (after November 4)	$+ 1^{\text{mm}} = - 0.000082$	C. G. S. units
December	$+ 1^{\text{mm}} = - 0.000082$	C. G. S. units

For *increase* in ordinate due to gradual loss of magnetism by magnet in time and for gradual change of position of magnet due to other causes such as error of knife edge, etc. :

January, February, and March	$= 0.12131^{\text{mm}}$	<i>increase</i> in ordinate per day
April	$= 0.0^{\text{mm}}$	<i>increase</i> in ordinate per day
May, June, July, and August	$= 0.1688^{\text{mm}}$	<i>increase</i> in ordinate per day
September	$= 0.232^{\text{mm}}$	<i>increase</i> in ordinate per day
October (after October 10)	$= 0.7461^{\text{mm}}$	<i>increase</i> in ordinate per day
November (after November 4)	$= 0.211^{\text{mm}}$	<i>increase</i> in ordinate per day
December	$= 0.211^{\text{mm}}$	<i>increase</i> in ordinate per day

The basis of reduction of the traces for each month derived from the absolute observations were :

January	1,	90.0 ^{mm}	at 18° C. = 0.579182	C. G. S. units
February	1,	90.0 ^{mm}	at 18° C. = 0.579501	C. G. S. units
March	1,	90.0 ^{mm}	at 18° C. = 0.579790	C. G. S. units
April	1,	90.0 ^{mm}	at 18° C. = 0.580109	C. G. S. units
May	9,	60.0 ^{mm}	at 24° C. = 0.579593	C. G. S. units
June	1,	80.0 ^{mm}	at 26° C. = 0.578685	C. G. S. units
July	1,	80.0 ^{mm}	at 30° C. = 0.579665	C. G. S. units
August	1,	90.0 ^{mm}	at 31° C. = 0.579457	C. G. S. units

September	1,	100.0 ^{mm}	at 31° C. = 0.579100 C. G. S. units
October	10,	26.0 ^{mm}	at 25° C. = 0.579276 C. G. S. units
November	5,	50.0 ^{mm}	at 25° C. = 0.579581 C. G. S. units
December	1,	50.0 ^{mm}	at 23° C. = 0.579732 C. G. S. units

The temperatures given were approximately the mean temperatures for the month, and all the ordinates for the month were reduced to those temperatures.

Total force.—The total force is calculated from the horizontal and vertical forces for the same time. $T = \sqrt{H^2 + V^2}$

Dip.—The dip is calculated from the horizontal and vertical forces for the same time. $\text{Tan. } D = \frac{V}{H}$

PERSONNEL OF THE OFFICE

Ensign J. A. HOOGEWERFF, U. S. Navy, was in charge from January 1, 1891, until September 5, 1891, after which he was assistant for the remainder of the year.

Lieut. Commander WALTON GOODWIN, U. S. Navy, took charge from September 5, 1891, until December 1, 1891, when he was relieved by Professor S. J. BROWN, U. S. Navy, who remained in charge of the office for the remainder of the year.

Ensign W. B. HOGGATT, U. S. Navy, was assistant from January 1, 1891, to January 27, 1891, when he was detached.

Ensign Robert E. COONTZ, U. S. Navy, was assistant from March 13, 1891, to June 30, 1891, when he was detached.

The observations and reductions for the year were carried out on the general plan formulated by Mr. HOOGEWERFF for the preceding years, and the work was done by Messrs. GOODWIN, HOOGEWERFF, HOGGATT, and COONTZ. Mr. J. B. WILSON kindly assisted in the reductions for the last quarter of the year.

RESULTS

All dates and times in the tables are expressed in Eastern Standard Civil Time, which is exactly 5^h slow of Greenwich, and 8^m 12^s.04 fast of Washington, Civil Time.

Table 1*—Mean hourly values of the declination for 1888, 1889, 1890, and 1891, and for the other magnetic elements for 1889, 1890, and 1891, compiled from Tables 2, 3, and 4.

2*—Mean hourly declination for each month of 1891, taken from Table 5.

3*—Mean hourly values of the horizontal force for each month of 1891, in C. G. S. units (dynes). From Table 6.

4*—Mean hourly values of the vertical force for each month of 1891, in C. G. S. units (dynes). Taken from Table 7.

* In Tables 1 to 4, inclusive, the maxima and minima, which were well marked, are printed in heavy type.

Table 5—Declination ordinates for each hour of 1891, expressed in minutes of arc, taken from daily declination traces.

6—Hourly values of the horizontal force in 1891, being the ordinates taken from the daily traces, corrected for temperature and converted into absolute measure with all corrections, except that the disturbances are not eliminated See “Horizontal force.”

7—Same as Table 6, except that for horizontal force read vertical force. See “Vertical force.”

8—Observations for horizontal intensity, 1891.

9—Observations for inclination (dip), 1891.

PLATES

The six plates are reduced copies of the actual traces made by the declination magnetograph, and the drawings were prepared originally at the Hydrographic Office for use on the Monthly Pilot Chart of the North Atlantic Ocean.

The breaks in the base lines are at every even hour of Eastern Standard Mean Time, which is exactly 5^h slow of Greenwich, and 8^m 12^s.04 fast of Washington, Mean Time.

TABLE 1—*Mean Hourly Values of the*

Hour	Declination (westerly)				Inclination (dip)			Hour
	1888	1889	1890	1891	1889	1890	1891	
A M	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	A M
1	3 58 28	4 01 17	4 05 29	4 09 16	71 05 50	71 04 24	71 04 54	1
2	3 58 31	4 01 17	4 05 25	4 09 16	05 48	04 22	04 52	2
3	3 58 19	4 01 08	4 05 20	4 09 13	05 48	04 21	04 49	3
4	3 58 01	4 00 51	4 05 01	4 09 10	05 47	04 19	04 46	4
5	3 57 47	4 00 32	4 04 46	4 08 41	05 45	04 17	04 40	5
6	3 57 06	4 00 03	4 04 01	4 08 04	05 44	04 15	04 37	6
7	3 56 16	3 59 11	4 03 07	4 07 06	05 49	04 21	04 46	7
8	3 55 46	3 58 49	4 02 36	4 06 14	06 05	04 40	05 08	8
9	3 56 23	3 59 20	4 02 53	4 06 29	06 26	05 04	05 35	9
10	3 58.03	4 00 45	4 04 26	4 07 49	06 38	05 15	05 46	10
11	4 00 29	4 02 59	4 06 37	4 10 29	06 32	05 13	05 52	11
12	4 02 07	4 04 15	4 08 29	4 12 49	06 20	05 00	05 41	12
P M								P M
1	4 02 11	4 04 51	4 09 37	4 14 07	06 08	04 37	05 18	1
2	4 02 02	4 04 43	4 09 35	4 14 19	05 55	04 21	05 03	2
3	4 01 22	4 04 02	4 08 49	4 13 29	05 49	04 17	04 47	3
4	4 00 13	4 02 54	4 07 39	4 12 16	05 50	04 15	04 44	4
5	3 59 14	4 01 54	4 06 41	4 10 58	05 52	04 19	04 55	5
6	3 58 38	4 01 25	4 06 03	4 10 08	05 59	04 24	05 02	6
7	3 58 27	4 01 14	4 05 40	4 09 20	05 58	04 28	05 08	7
8	3 58 16	4 01 04	4 05 21	4 09 08	06 00	04 27	05 06	8
9	3 58 16	4 00 58	4 05 04	4 08 47	05 58	04 27	05 04	9
10	3 58 14	4 00 52	4 05 01	4 08 37	05 59	04 26	05 00	10
11	3 58 19	4 00 58	4 05 03	4 08 41	05 56	04 25	05 01	11
12	3 58 19	4 01 01	4 05 10	4 08 59	05 53	04 25	04 56	12
Mean	3 58 47	4 01 31	4 05 45	4 09 43	71 05 59	71 04 31	71 05 04	Mean

Magnetic Elements for the Years 1888-91

Hour	Horizontal Force (C-G-S units)			Vertical Force (C-G-S units)			Total Force (C-G-S units)			Hour
	1889	1890	1891	1889	1890	1891	1889	1890	1891	
A M										A M
1	.198717	.198626	.198576	.580314	.579282	.579393	.613395	.612392	.612477	1
2	722	629	584	309	271	393	391	382	480	2
3	722	632	592	308	272	388	391	384	478	3
4	726	641	600	313	278	380	396	392	473	4
5	737	651	620	328	289	385	414	406	491	5
6	746	658	630	341	298	388	430	417	490	6
7	730	644	605	340	300	399	423	413	493	7
8	677	587	534	334	293	394	407	386	465	8
9	605	511	443	312	273	375	356	341	417	9
10	554	463	398	275	243	340	305	298	370	10
11	558	454	369	237	218	312	270	274	333	11
12	597	488	403	239	216	315	285	285	348	12
P M										P M
1	658	558	483	307	217	335	368	309	393	1
2	709	616	544	332	245	378	410	355	453	2
3	734	646	607	355	281	417	439	397	510	3
4	740	658	627	376	300	448	461	419	546	4
5	732	653	600	378	310	467	460	426	555	5
6	711	637	582	378	306	479	453	417	561	6
7	710	623	565	370	302	476	445	409	552	7
8	704	623	564	369	301	463	442	408	541	8
9	710	624	566	365	303	453	440	410	531	9
10	704	626	574	360	300	439	434	409	521	10
11	709	627	567	348	293	422	424	402	502	11
12	713	624	575	329	287	402	407	395	486	12
Mean	.198693	.198604	.198550	.580330	.579278	.579401	.613402	.612380	.612477	Mean

TABLE 2—*Mean Hourly Values of the Declination (westerly)*

Month	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
1891	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°
January	8.38	8.14	8.30	8.45	8.18	8.28	7.91	6.93	4.99	4.68	6.68	9.87
February	8.23	8.18	8.33	8.19	8.19	8.22	7.95	6.73	6.10	6.52	8.01	9.84
March	7.85	8.45	8.20	7.97	8.05	7.32	6.89	5.60	5.92	7.26	9.33	10.99
April	8.28	8.39	8.36	7.74	6.91	6.48	6.67	5.71	6.24	7.94	10.92	12.92
May	8.26	8.25	7.82	7.95	6.28	5.55	4.98	4.96	6.43	8.87	12.03	14.19
June	8.91	9.21	8.63	8.30	7.71	6.36	4.90	4.62	5.54	7.10	9.83	12.05
July	9.29	9.24	8.84	8.49	7.49	5.86	4.41	3.40	4.32	6.25	9.71	12.45
August	9.17	9.56	9.70	9.73	8.80	6.81	4.44	3.51	5.16	8.09	12.14	14.62
September	9.47	8.94	8.77	7.89	8.62	8.30	7.18	6.70	7.52	9.81	12.98	15.40
October	9.96	10.00	10.05	10.95	10.38	10.62	8.81	6.79	6.73	7.52	10.48	13.34
November	11.31	10.97	11.18	11.95	11.54	11.38	9.74	9.14	9.05	9.79	11.64	13.79
December	12.02	11.88	12.30	12.29	12.01	11.54	11.36	10.70	9.87	9.90	12.02	14.43
Year	9.26	9.27	9.21	9.16	8.68	8.06	7.10	6.23	6.49	7.81	10.48	12.82

for Each Month of 1891 (Taken from Table 5)

Hours, P. M.												Range	Mean Declination (westerly)
1	2	3	4	5	6	7	8	9	10	11	12		
4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°		° ' "
'	'	'	'	'	'	'	'	'	'	'	'	'	
11. 17	11.32	10. 93	9. 89	8. 75	8. 03	7. 65	7. 56	7. 36	7.23	7. 31	7. 77	6. 64	4 08 10
10. 74	11.11	10. 71	10. 36	9. 96	9. 38	8. 71	8. 25	8. 16	8. 01	7.16	7. 90	5. 01	4 08 32
12. 63	13.41	12. 49	11. 62	10. 56	9. 60	8. 63	8. 54	7.66	8. 52	7. 73	7. 95	7. 81	4 08 53
14. 00	14.21	13. 11	11. 69	10. 84	9. 29	8. 74	8. 41	8. 11	7. 81	7.73	8. 47	8. 50	4 09 07
15.01	14. 37	13. 57	12. 21	10. 78	9. 26	7. 98	7. 66	7. 62	7.46	7. 65	8. 02	10. 05	4 09 03
13. 51	14.09	13. 53	12. 40	10. 85	9. 73	9. 02	8. 93	8. 74	8. 57	8.37	8. 74	9. 47	4 09 09
14. 09	14.89	14. 34	13. 03	11. 23	9. 74	9. 30	8. 51	8. 97	8.32	8. 91	9. 14	11. 49	4 09 11
15.75	15. 73	14. 26	12. 70	11. 05	9. 49	9. 01	9. 07	9. 23	8.15	8. 54	8. 69	12. 24	4 09 44
16.27	15. 48	14. 17	12. 21	10. 42	10. 33	9. 40	9. 78	8.47	9. 13	8. 84	9. 23	9. 57	4 10 13
15. 02	15.32	14. 47	12. 98	11. 29	11. 82	10. 50	10. 53	10. 09	9.18	10. 25	9. 81	8. 59	4 10 42
15. 50	16.10	15. 20	14. 07	12. 71	12. 33	11. 41	11. 26	9.96	10. 40	10. 59	10. 78	7. 05	4 11 44
15.75	15. 70	14. 94	13. 95	13. 09	12. 63	11. 77	11. 09	10. 99	10.54	11. 10	11. 26	5. 88	4 12 13
14. 12	14.31	13. 48	12. 26	10. 96	10. 14	9. 34	9. 13	8. 78	8.61	8. 68	8. 98	8. 53	4 09 43

TABLE 3—Mean Hourly Values of the Horizontal Force in C-G-S Units (Dynes)

1891

Hour	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	MEAN
A M													
1	.198501	.198472	.198615	.198576	.198554	.198647	.198564	.198556	.198471	.198591	.198750	.198619	.198576
2	519	520	627	569	581	647	547	573	472	564	756	628	584
3	537	522	620	580	610	645	535	570	482	603	759	640	592
4	555	539	625	599	607	642	541	558	480	620	776	658	600
5	579	557	658	596	593	659	552	571	507	655	823	690	620
6	590	575	639	576	624	667	580	583	492	645	846	710	630
7	592	584	627	555	550	638	564	549	450	593	843	711	605
8	600	550	589	479	437	548	485	424	331	499	771	689	534
9	571	504	511	381	343	485	386	296	215	343	660	626	443
10	459	474	459	281	330	473	336	255	145	254	573	539	398
11	311	399	455	266	434	516	374	313	165	249	539	405	369
12	261	376	460	326	551	596	464	406	216	285	511	384	403
P M													
1	334	380	462	402	666	693	592	536	342	407	537	443	483
2	408	404	501	475	698	768	640	605	428	476	606	523	544
3	489	435	567	579	709	806	693	658	501	539	704	606	607
4	554	484	592	612	676	792	689	635	533	532	756	671	627
5	551	487	572	570	622	719	631	602	464	518	788	671	600
6	537	519	547	552	592	668	561	551	445	552	790	667	582
7	530	505	507	519	590	640	522	512	438	566	793	652	565
8	513	488	532	564	557	620	507	545	463	572	761	645	564
9	522	492	560	569	517	643	531	543	460	574	760	619	566
10	508	494	599	566	585	639	530	562	450	565	780	609	574
11	502	490	571	561	562	657	533	522	466	575	754	608	567
12	496	496	615	570	576	638	536	549	468	599	755	606	575
Mean	.198501	.198489	.198563	.198513	.198565	.198644	.198537	.198520	.198412	.198516	.198725	.198609	.198550

TABLE 4—Mean Hourly Values of the Vertical Force in C-G-S Units (Dynes)

1891

HOURL	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	MEAN
A M													
1	.579462	.579464	.579224	.579479	.579688	.578751	.579409	141	045	393	.579808	.579855	.579393
2	464	455	222	473	708	729	399	.579152	.579055	.579400	795	861	393
3	467	442	211	467	689	739	392	144	036	415	798	861	388
4	464	431	209	393	664	745	398	149	035	419	796	858	380
5	461	431	208	433	627	784	416	160	041	415	798	849	385
6	456	425	208	430	627	797	420	171	043	428	800	846	388
7	476	443	232	473	617	797	419	175	040	447	813	851	399
8	489	433	220	500	596	780	412	160	020	449	810	854	394
9	491	410	199	489	568	730	390	119	019	450	793	847	375
10	451	378	160	438	544	657	377	057	005	425	764	825	340
11	421	366	112	384	545	623	312	031	004	399	741	801	312
12	421	383	118	385	581	599	298	036	022	392	739	806	315
P M													
1	469	402	168	397	589	585	276	061	067	394	781	832	335
2	508	434	204	472	680	613	316	106	101	422	822	861	378
3	532	461	261	528	689	651	392	168	130	457	853	877	417
4	529	476	295	611	703	750	427	203	177	476	861	869	448
5	514	491	322	654	729	773	465	235	193	503	853	866	467
6	523	506	365	675	725	818	472	234	176	506	861	883	479
7	522	507	358	677	732	822	464	205	158	514	863	885	476
8	511	499	358	621	728	810	451	187	147	504	857	883	463
9	502	488	359	609	707	806	434	190	119	493	854	879	453
10	494	478	342	582	673	802	424	167	107	482	842	876	439
11	484	466	318	529	645	790	411	171	080	467	835	864	422
12	475	449	287	484	630	777	408	143	056	443	819	856	402
Mean	.579483	.579443	.579248	.579508	.579654	.578738	.579399	.579149	.579078	.579446	.579815	.579856	.579401

TABLE 5—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
January												
1	96.6	97.6	96.6	96.7	96.4	96.6	96.4	95.6	94.4	93.8	.	.
2	97.1	97.0	97.1	97.0	97.0	98.3	96.1	95.0	93.2	94.1	96.0	98.7
3	96.5	96.4	96.6	96.5	96.9	96.7	97.0	95.1	93.0	93.7	96.2	99.6
4	96.9	97.0	97.0	97.0	97.1	96.5	96.0	94.5	92.8	93.3	95.6	98.1
5	97.0	97.1	97.1	97.0	97.0	97.1	97.0	96.6	94.3	92.2	94.1	99.5
6	97.2	96.9	96.7	97.2	96.6	97.0	97.0	95.7	93.5	93.4	97.7	99.0
7	97.0	97.3	98.7	97.0	96.8	96.5	96.9	96.1	95.0	94.0	96.1	98.5
8	96.9	97.1	97.0	97.0	97.0	96.6	96.3	95.4	94.0	92.7	95.9	98.6
9	97.0	97.1	96.9	96.9	96.7	96.7	96.3	96.0	95.0	93.9	95.0	97.5
10	95.8	96.0	97.1	96.7	96.9	97.0	96.5	95.8	94.3	93.3	94.0	96.3
11	97.0	97.0	96.9	96.9	97.9	97.0	96.2	96.9	93.9	92.1	93.3	96.2
12	97.0	96.4	97.1	96.0	95.0	96.5	96.3	95.1	93.5	92.3	94.0	98.0
13	97.0	96.9	96.9	96.8	96.8	96.8	96.8	96.0	94.3	93.9	95.4	98.5
14	97.0	97.4	97.1	96.2	96.0	97.2	96.0	95.8	93.8	93.4	96.3	100.1
15	97.0	96.8	97.0	96.9	96.5	96.1	96.0	94.8	92.8	94.2	96.6	98.8
16	96.5	96.6	95.8	95.0	96.0	94.7	95.0	95.0	90.0	92.8	96.0	102.8
17	97.0	96.1	96.8	98.1	96.3	97.0	96.0	95.4	94.0	94.6	96.0	98.6
18	96.0	96.1	96.9	96.2	97.3	98.0	97.0	95.1	93.8	93.2	94.8	97.8
19	102.0	95.8	94.4	103.3	96.3	98.2	97.5	95.7	94.0	95.0	95.0	96.8
20	96.2	95.0	96.9	97.0	100.0	99.3	98.1	95.0	92.9	92.0	94.2	97.3
21	96.7	96.0	97.4	96.7	97.0	96.7	96.5	95.0	93.1	92.2	94.8	.
22	96.0	96.9	96.8	97.0	97.2	97.1	96.0	95.0	93.0	93.0	96.0	100.0
23	96.1	96.1	96.0	96.0	96.5	96.5	96.0	94.3	92.9	92.0	94.0	97.7
24	96.8	96.8	97.0	97.2	95.5	95.9	97.0	100.3	95.9	93.9	96.0	98.3
25	97.0	97.0	96.9	97.0	96.3	97.0	96.0	94.4	92.4	93.0	95.1	98.0
26	97.0	96.9	96.7	96.5	96.3	96.0	96.0	94.5	94.0	94.1	96.2	99.4
27	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.
30	97.4	97.4	97.4	97.3	97.2	96.7	97.3	95.4	93.3	92.7	93.7	.
31	97.1	97.4	97.8	97.8	96.9	96.7	96.5	94.7	93.0	92.6	94.1	97.2
Mean	96.96	96.72	96.88	97.03	96.76	96.86	96.49	95.51	93.57	93.26	95.26	98.45

Declination for the Month, 1891 January

for any hour added to the base line value gives the absolute westerly declination at that hour

$= 2^{\circ} 31' 25''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
January	'	'	'	'	'	'	'	'	'	'	'	'	'
1	99.2	99.5	99.1	98.1	97.0	96.2	96.1	96.0	96.0	95.0	95.0	96.2	96.55
2	100.1	100.3	99.1	98.0	97.0	96.1	96.1	96.0	96.0	95.6	96.3	96.5	96.82
3	100.9	100.3	98.3	96.8	96.8	96.4	96.1	96.0	96.1	96.4	96.2	96.6	96.71
4	99.3	99.1	98.4	97.7	97.0	96.9	96.5	96.4	96.1	96.4	97.0	97.0	96.65
5	101.0	99.1	97.8	96.8	96.6	96.7	96.4	96.5	96.2	96.7	97.0	97.2	96.83
6	99.8	99.2	98.0	96.9	96.7	96.5	96.5	96.5	96.6	96.9	97.1	97.0	96.90
7	99.2	98.5	97.9	97.1	96.5	96.4	96.2	96.0	96.1	96.3	96.5	96.7	96.80
8	99.5	99.5	98.5	97.2	96.4	96.0	96.0	95.9	96.0	96.2	96.5	96.9	96.63
9	99.0	99.0	98.5	97.8	97.0	96.4	96.1	96.0	96.0	94.1	96.0	96.2	96.55
10	97.9	98.2	98.2	97.6	96.9	96.1	96.0	95.9	95.7	95.5	94.9	96.1	96.20
11	99.0	100.1	100.0	99.6	98.3	96.1	96.0	95.7	95.5	95.0	95.4	96.1	96.59
12	98.5	99.0	99.0	98.3	97.0	96.7	96.0	95.4	95.2	96.0	96.1	96.8	96.30
13	101.0	102.0	100.9	98.1	96.8	96.2	96.0	96.0	96.0	96.2	93.8	96.4	96.90
14	102.0	102.0	101.1	99.3	98.0	96.8	96.0	95.9	95.9	96.0	96.3	96.6	97.17
15	100.0	100.0	99.2	98.0	97.1	96.3	96.0	95.8	95.5	95.8	96.0	93.0	96.51
16	99.7	100.0	101.0	102.0	99.1	98.2	97.0	96.2	96.2	96.0	93.7	94.5	96.66
17	99.6	99.6	99.0	98.8	97.8	98.9	95.7	96.1	95.7	95.4	96.2	96.8	96.90
18	99.7	102.0	102.0	101.0	99.0	91.9	93.1	95.8	92.9	93.1	95.0	96.1	96.41
19	99.8	101.0	102.0	100.0	98.1	98.0	96.5	97.5	95.9	96.0	95.8	94.9	97.48
20	99.1	99.0	99.0	98.7	97.2	96.8	96.8	96.2	96.2	96.4	97.0	96.2	96.77
21	99.1	99.0	98.5	97.6	97.0	97.0	97.0	95.8	97.1	95.0	96.0	96.0	96.40
22	102.4	102.0	101.2	99.5	98.0	96.9	96.6	96.0	96.1	96.3	96.4	96.8	97.18
23	99.3	99.0	98.9	98.1	97.0	96.8	96.2	96.0	96.0	96.0	92.0	96.7	96.09
24	100.0	100.0	99.8	98.3	97.1	97.0	96.7	96.0	96.0	96.2	96.4	96.9	97.11
25	99.2	99.0	98.3	98.0	97.0	97.0	96.0	96.0	94.8	95.9	96.2	96.8	96.43
26	102.0	102.0	102.0	. .	. .	. .	. .	. .	. .	. .	. .	. .	97.19
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	100.0	100.2	99.4	97.4	96.8	96.8	96.6	96.8	95.0	96.6	97.0	97.51
30	. .	. .	101.0	99.1	97.7	97.1	97.0	96.9	96.9	96.9	97.0	97.0	96.78
31	100.0	100.8	100.7	99.3	97.8	96.9	97.0	96.7	96.8	96.3	96.4	96.9	96.78
Mean	99.75	99.90	99.51	98.47	97.33	96.61	96.23	96.14	95.94	95.81	95.89	96.35	96.74

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
February												
1	96.9	97.0	97.3	96.7	95.8	96.0	96.0	96.4	94.5	94.1	96.2	97.4
2	96.6	97.2	97.4	97.0	97.2	97.3	96.9	95.3	93.7	92.8	95.0	96.7
3	96.9	97.4	97.5	97.6	97.3	97.0	97.2	95.8	95.2	94.6	96.0	98.2
4	97.1	97.3	97.6	97.5	97.2	97.0	96.9	96.0	95.1	95.3	96.5	98.0
5	97.6	97.4	97.3	97.3	97.0	95.8	96.0	95.2	93.2	95.3	96.5	100.3
6	96.9	100.0	97.1	96.8	96.8	97.0	97.0	96.0	95.0	96.0	96.9	99.3
7	97.0	97.1	97.8	97.3	97.5	97.1	96.9	96.0	95.2	96.0	97.4	98.0
8	97.0	97.6	97.3	97.2	97.1	97.0	96.3	96.8	95.8	96.3	98.0	98.6
9	97.1	97.4	98.0	97.0	96.8	96.1	95.7	94.9	94.2	93.2	99.4	101.2
10	97.8	98.0	97.3	95.8	97.0	96.9	96.0	95.5	93.0	93.7	95.7	98.0
11	100.0	99.7	96.7	95.7	95.7	95.8	95.2	94.8	94.0	94.8	96.1	97.7
12	93.2	92.3	92.1	95.8	95.2	95.4	95.0	94.4	92.6	100.2	98.1	97.2
13	97.6	97.0	98.5	98.0	97.9	97.1	96.7	94.6	94.0	93.8	94.5	95.5
14	96.8	96.0	100.9	98.0	95.0	99.0	99.7	98.0	96.7	97.0	97.5	102.2
15	96.0	86.3	89.7	95.5	106.0	109.7	109.0	103.8	100.0	97.6	96.0	95.5
16	97.5	97.4	97.0	96.5	97.5	95.5	96.0	95.0	95.3	94.8	95.1	95.5
17	96.2	96.7	97.0	96.9	95.6	96.0	100.0	97.6	94.7	94.8	95.9	97.0
18	97.0	97.1	97.6	98.4	96.0	97.0	96.2	95.7	96.0	96.0	97.0	97.5
19	96.3	97.7	96.8	97.0	96.3	96.0	95.0	93.7	95.4	96.0	97.4	98.0
20	97.2	97.4	97.0	96.7	96.7	95.7	95.0	94.5	94.0	95.0	97.8	100.5
21	97.7	97.0	97.0	97.0	96.8	96.3	96.0	95.0	95.6	96.2	98.9	100.7
22	97.6	97.9	97.0	97.0	96.3	96.0	95.2	93.7	93.5	95.0	97.4	100.0
23	97.5	98.0	98.4	96.2	95.7	95.4	94.1	94.5	93.9	95.6	98.1	99.7
24	97.7	97.5	97.0	96.8	96.6	96.2	95.2	93.2	93.4	94.5	97.0	100.9
25	97.3	97.4	96.9	96.4	95.4	95.7	94.8	91.5	94.6	94.8	95.6	98.1
26	97.2	97.1	97.0	96.8	96.4	96.2	96.0	94.0	93.0	93.1	95.6	102.0
27	96.6	97.2	97.0	96.7	96.8	96.7	95.8	95.5	94.8	95.0	96.4	97.8
28	97.3	97.0	98.1	96.9	96.6	96.3	95.8	94.0	95.5	94.1	95.5	97.1
Mean	96.91	96.86	97.01	96.87	96.87	96.90	96.63	95.41	94.78	95.20	96.69	98.52

Declination for the Month, 1891 February

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $\equiv 2^{\circ} 31' 19''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
February													
1	101.1	101.1	100.0	99.4	97.7	97.2	97.0	96.8	96.7	96.3	96.0	97.0	97.11
2	98.8	99.0	98.7	98.2	97.6	96.9	96.7	96.8	96.8	96.9	96.9	96.3	96.79
3	100.2	100.2	99.8	99.0	98.0	97.2	97.0	97.0	97.0	97.0	97.0	97.0	97.38
4	98.4	98.7	98.4	98.3	98.0	97.9	97.1	97.0	97.0	97.0	97.2	97.4	97.25
5	100.7	100.1	99.4	100.0	98.7	98.1	98.6	98.2	97.1	97.0	97.2	97.3	97.55
6	99.2	99.2	99.7	100.0	101.2	99.1	99.9	100.1	93.7	96.0	96.8	97.8	97.81
7	98.5	98.3	97.9	98.0	98.0	98.0	97.1	96.4	97.8	97.6	97.0	96.8	97.28
8	98.2	97.4	97.0	97.3	98.0	97.9	97.1	97.0	97.0	97.0	97.2	97.2	97.22
9	101.0	101.7	103.5	98.7	98.0	98.0	92.0	93.9	96.0	94.7	97.0	98.4	97.25
10	99.3	101.1	98.0	99.0	99.3	98.0	96.0	96.3	96.8	96.9	97.5	97.9	97.08
11	98.6	99.6	103.1	102.8	103.3	99.2	97.1	96.4	96.0	94.8	83.0	94.0	96.83
12	100.2	102.2	101.0	103.6	99.0	101.0	98.3	96.7	95.3	95.7	96.0	96.7	96.98
13	99.4	101.0	102.9	100.3	102.0	98.8	97.8	97.0	96.7	98.0	91.5	95.8	97.31
14	101.0	102.2	99.5	102.5	102.0	95.5	97.5	96.1	98.0	94.5	94.0	87.1	97.78
15	96.7	97.6	98.5	98.3	98.3	97.9	97.8	97.9	97.6	97.3	97.1	97.1	98.07
16	95.8	96.6	98.0	98.9	99.7	99.0	98.1	99.4	98.2	97.7	97.5	97.2	97.05
17	98.6	101.0	98.8	98.2	98.5	98.4	98.5	92.0	97.0	97.8	97.0	97.7	97.16
18	97.6	97.4	97.1	97.1	95.6	97.8	98.3	97.0	96.8	96.0	96.2	96.3	96.86
19	98.3	97.8	97.0	96.4	97.0	97.1	97.4	97.5	97.4	96.8	97.0	97.0	96.76
20	101.0	101.0	99.2	97.8	96.9	97.5	97.4	97.1	97.2	97.3	97.3	97.1	97.30
21	101.1	100.7	98.9	97.3	97.1	97.8	97.5	96.8	96.6	97.0	97.5	97.6	96.67
22	99.9	99.1	98.9	98.3	98.0	98.0	97.6	97.5	97.2	97.3	93.5	96.3	97.01
23	100.7	100.5	99.5	98.4	97.8	98.1	97.9	97.5	97.2	97.3	97.1	97.0	97.29
24	103.0	102.8	101.8	100.6	99.2	99.2	96.7	97.7	96.7	96.4	96.6	97.0	97.65
25	99.7	99.7	99.6	99.0	98.6	98.4	97.8	97.3	97.0	97.0	97.0	97.0	96.94
26	100.4	100.3	98.9	98.2	97.5	97.7	97.6	96.5	96.6	96.0	92.2	96.2	96.77
27	98.5	99.2	99.2	99.0	98.4	98.0	97.6	97.0	97.0	97.2	96.0	97.0	97.10
28	97.9	98.5	98.6	98.6	98.5	98.1	97.4	97.1	97.0	96.9	97.1	97.1	96.96
Mean	99.42	99.79	99.39	99.04	98.64	98.06	97.39	96.93	96.84	96.69	95.84	96.58	97.22

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
March	/	/	/	/	/	/	/	/	/	/	/	/
1	97.1	97.1	97.4	97.1	97.0	96.9	96.2	95.5	95.0	95.1	95.8	97.2
2	97.2	97.3	97.0	96.6	96.7	95.5	94.5	92.5	94.3	96.7	.	99.0
3	97.3	97.0	96.2	94.3	96.5	97.0	97.8	96.2	92.5	92.5	94.8	97.8
4	101.3	99.5	96.8	96.0	96.3	99.2	97.9	95.3	98.3	97.0	99.4	101.8
5	97.1	96.5	98.1	95.8	99.3	96.4	97.3	93.3	95.0	94.2	96.5	97.5
6	99.6	97.8	98.1	100.4	99.7	95.7	95.4	95.6	96.0	96.1	98.7	101.2
7	96.2	97.7	98.7	98.0	96.2	95.5	94.8	94.7	95.0	98.1	101.1	102.1
8	97.9	98.0	100.8	97.8	97.0	96.8	96.0	95.3	95.3	96.7	99.2	101.0
9	98.0	98.0	97.1	97.0	97.0	97.0	95.3	94.2	95.0	96.7	98.8	100.2
10	98.0	98.0	97.1	96.7	96.7	95.7	94.6	93.8	93.8	94.8	97.0	99.1
11	97.3	97.4	97.4	96.7	96.9	96.0	94.8	93.2	93.0	93.3	96.7	99.3
12	97.3	97.8	96.7	96.8	95.6	96.0	96.3	94.5	92.7	98.3	99.3	100.7
13	98.0	96.1	93.7	94.5	94.5	97.0	95.2	93.0	92.9	93.5	96.3	99.1
14	97.8	97.7	99.0	97.3	96.0	97.7	95.5	93.0	92.7	95.8	98.4	101.2
15	97.0	98.1	98.0	98.2	96.1	95.5	98.1	95.9	95.0	95.1	97.1	98.0
16	95.5	100.7	93.3	96.5	98.7	96.3	96.7	94.6	96.4	101.3	99.0	100.6
17	97.0	97.4	97.0	98.0	97.3	98.2	99.3	95.8	95.6	96.9	99.6	99.9
18	92.8	98.2	98.0	96.0	102.8	94.4	94.2	94.2	94.9	93.9	96.3	99.0
19	97.0	97.8	97.6	96.9	96.9	95.8	96.0	96.8	95.8	96.4	100.1	102.7
20	99.1	96.6	97.1	96.9	96.9	96.7	94.9	92.7	93.8	95.2	98.9	99.9
21	97.3	97.1	97.0	97.1	96.7	96.5	95.2	94.8	95.8	98.4	100.2	100.6
22	97.3	97.1	98.8	96.8	96.1	95.6	94.5	94.3	94.8	96.3	98.0	99.3
23	97.8	96.9	101.6	91.7	95.0	95.2	96.1	95.2	92.9	96.1	97.9	100.1
24	89.0	98.0	99.3	98.0	98.9	95.9	96.3	97.8	97.9	96.0	96.2	99.2
25	96.3	97.2	96.1	103.1	99.1	95.6	97.3	92.8	95.1	96.9	99.1	100.9
26	92.0	95.9	97.0	100.1	96.3	95.4	95.2	95.0	95.5	95.9	97.9	100.0
27	98.0	97.4	97.9	96.9	97.1	96.9	96.2	95.8	96.9	99.4	100.5	100.2
28	96.9	98.3	97.4	96.4	96.9	96.2	95.9	94.9	95.2	96.6	98.9	100.3
29	98.1	98.0	97.3	97.1	97.2	96.8	95.7	94.9	94.8	95.9	98.7	101.0
30	97.0	98.0	94.0	95.3	95.6	95.8	94.9	93.7	96.1	95.9	98.9	101.0
31	92.5	90.8	89.7	94.5	95.3	95.0	93.0	91.8	92.8	97.6	98.9	98.2
Mean	96.80	97.40	97.15	96.92	97.00	96.27	95.84	94.55	94.87	96.21	98.28	99.94

Declination for the Month, 1891 March

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $= 2^{\circ} 31' 03''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
March													
1	98.7	100.0	100.6	100.0	99.4	98.5	97.7	97.2	95.5	97.0	96.7	96.6	97.30
2	105.7	109.7	102.5	98.6	99.2	99.2	98.7	98.0	97.1	97.5	95.7	98.4	98.07
3	101.5	101.0	101.7	100.9	100.4	100.4	97.7	92.5	90.6	92.7	94.2	95.0	96.60
4	102.3	104.3	101.7	101.2	100.8	100.9	98.7	95.5	96.8	96.7	96.9	97.7	98.85
5	100.7	103.7	100.0	100.0	102.4	93.1	90.9	98.3	96.8	97.0	97.1	95.3	97.18
6	101.8	101.2	101.0	100.1	99.2	98.3	97.7	95.8	96.6	97.3	96.7	100.0	98.34
7	102.3	100.7	100.0	99.0	98.0	98.2	98.3	94.9	97.0	97.7	98.0	98.1	97.93
8	101.3	101.0	100.0	98.7	98.0	98.0	98.0	98.0	98.0	98.2	98.0	97.8	98.20
9	100.8	100.7	100.0	99.8	100.1	100.2	100.1	99.3	98.3	97.1	98.1	98.3	98.21
10	101.0	101.8	101.2	99.5	98.2	98.0	98.0	97.8	93.5	96.8	97.0	97.8	97.33
11	102.3	102.0	101.5	100.1	98.8	98.2	98.1	97.7	97.7	97.5	97.7	97.6	97.55
12	102.3	105.2	106.6	106.0	106.0	106.6	103.7	100.3	89.1	94.3	97.5	98.0	99.07
13	102.0	102.5	102.2	100.5	99.1	98.7	98.5	97.4	98.0	97.1	97.8	98.0	97.32
14	103.2	104.0	103.1	102.8	102.6	98.5	101.2	102.7	93.6	101.0	94.0	97.3	98.61
15	99.5	102.4	102.4	105.0	100.7	100.0	99.4	95.5	98.7	97.0	93.4	96.5	98.03
16	100.0	101.6	100.4	100.3	100.2	94.8	93.9	94.9	95.9	101.1	96.2	97.1	97.74
17	100.7	101.9	99.9	100.3	97.9	96.4	89.0	95.1	95.1	93.9	90.9	92.1	96.88
18	100.1	100.2	100.5	99.1	99.0	95.9	98.8	98.3	96.9	97.9	96.9	98.1	97.31
19	102.9	102.8	101.0	101.3	98.2	95.5	93.1	98.0	98.0	97.9	97.3	96.8	98.44
20	100.3	100.9	100.6	99.4	99.0	99.1	98.4	97.9	95.2	97.9	97.9	97.8	97.63
21	100.0	100.9	100.0	98.9	99.0	98.8	98.7	98.4	98.6	98.1	97.9	97.9	98.08
22	101.2	102.2	101.1	100.0	98.9	98.9	98.8	98.8	98.6	97.3	98.0	97.9	97.94
23	101.1	102.0	101.2	99.2	97.7	97.8	95.0	97.3	98.0	97.1	97.8	89.1	97.07
24	101.1	102.3	101.9	102.7	93.5	98.0	99.0	98.1	98.0	97.9	95.1	94.6	97.70
25	101.4	101.3	100.7	98.9	98.1	97.9	97.8	97.8	98.0	97.9	98.3	98.0	98.15
26	101.3	100.4	100.8	100.3	98.7	95.8	96.3	98.2	98.1	97.1	98.0	97.9	97.46
27	102.3	102.1	101.8	99.9	97.8	98.0	94.1	96.0	97.9	98.5	98.2	98.1	98.25
28	102.3	102.2	101.4	99.9	99.0	98.8	98.9	98.1	98.7	98.8	98.4	98.1	98.27
29	102.9	102.9	101.1	99.4	98.1	98.0	98.7	98.1	97.1	97.0	98.1	97.0	98.08
30	102.1	103.2	101.0	102.0	102.9	101.2	102.0	96.8	95.4	99.0	91.0	96.0	97.87
31	104.0	106.0	106.1	103.7	104.0	103.0	95.7	99.6	98.1	99.2	98.2	95.0	97.61
Mean	101.58	102.36	101.44	100.57	99.51	98.55	97.58	97.49	96.61	97.47	96.68	96.90	97.83

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
April	/	/	/	/	/	/	/	/	/	/	/	/
1	100.1	97.0	93.3	99.0	93.6	94.8	94.9	94.1	94.7	95.5	98.9	102.1
2	98.0	96.4	101.9	97.2	95.1	95.0	96.6	96.2	94.9	94.0	97.3	100.2
3	98.0	98.3	102.0	100.4	97.4	96.8	96.8	94.7	97.1	97.0	98.7	100.0
4	98.0	98.0	98.7	98.1	97.0	96.4	95.3	95.0	95.7	98.0	99.5	102.5
5	97.9	97.9	97.8	98.1	98.0	97.1	96.0	95.0	95.0	95.4	98.0	101.0
6	98.5	98.2	98.0	98.0	97.8	97.1	96.4	95.1	95.0	96.8	100.5	102.5
7	98.3	98.9	96.4	97.0	98.0	97.5	101.3	95.4	92.2	93.6	96.2	100.0
8	94.8	97.9	103.0	93.3	92.3	94.2	103.1	95.7	95.2	101.0	103.0	109.4
9	98.3	98.9	99.0	100.5	100.0	97.0	95.5	95.5	97.0	98.0	100.8	104.0
10	98.6	97.3	104.1	97.5	97.2	96.0	98.3	94.2	93.2	96.6	101.3	105.1
11	98.7	98.0	99.0	98.2	97.0	97.0	95.8	94.0	93.2	96.0	100.2	102.3
12	97.0	97.2	98.0	96.6	97.0	100.0	100.0	96.0	91.9	94.3	98.0	100.0
13	92.9	103.2	95.7	97.8	97.2	96.2	96.3	94.6	95.4	96.6	97.6	100.0
14	96.8	98.8	100.0	97.8	97.1	98.2	98.1	97.0	95.8	97.3	100.1	101.0
15	98.6	98.0	97.7	101.0	97.5	97.8	96.0	96.0	95.8	96.1	98.4	100.2
16	98.1	98.1	98.0	98.0	97.5	97.4	96.6	96.2	97.4	99.5	100.8	101.4
17	98.7	97.1	95.1	93.2	95.0	95.2	102.8	105.0	105.0	105.0	110.4	109.0
18	97.7	96.6	100.6	95.0	95.5	94.5	93.1	93.2	106.0	100.0	101.0	101.6
19	99.7	98.5	98.0	97.8	98.1	97.2	96.0	95.8	96.5	99.0	102.5	104.0
20	98.0	98.1	98.0	96.5	96.0	94.0	95.7	101.0	97.0	100.0	104.0	106.2
21	102.3	100.3	96.1	96.1	95.5	95.0	93.8	93.2	95.6	99.0	103.0	103.4
22	98.2	101.3	96.0	96.8	97.4	95.0	95.0	95.0	96.0	98.0	102.0	102.3
23	98.0	98.0	97.6	98.4	98.2	96.4	95.3	95.1	97.0	100.1	103.8	105.4
24	98.2	98.4	98.0	97.5	99.4	98.0	95.0	95.5	97.0	100.0	102.1	103.4
25	99.8	98.3	98.6	98.1	97.1	96.3	98.2	97.1	99.0	100.0	103.2	105.8
26	98.4	98.2	98.0	97.6	97.1	96.0	95.0	95.0	96.1	99.3	102.0	102.8
27	98.6	98.1	98.0	97.5	95.3	95.0	93.2	93.0	93.3	96.0	98.1	100.0
28	98.7	98.3	98.1	98.0	97.6	96.0	95.0	94.4	94.6	96.7	100.0	102.4
29	98.1	97.0	94.3	99.7	96.1	96.8	96.0	95.3	95.1	97.0	100.0	102.0
30	97.4	97.5	97.9	97.7	97.4	96.5	95.1	94.1	95.5	98.5	102.2	103.7
Mean	98.15	98.26	98.23	97.61	96.78	96.35	96.54	95.58	96.11	97.81	100.79	102.79

Declination for the Month, 1891 April

for any hour added to the base-line value gives the absolutely westerly declination at that hour

$-2^{\circ} 30' 08''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
April	/	/	/	/	/	/	/	/	/	/	/	/	/
1	104.7	105.3	103.8	101.2	100.8	102.0	90.0	94.0	99.0	98.0	92.3	95.2	97.68
2	101.9	102.2	102.0	101.2	99.5	96.0	92.5	92.0	99.0	98.0	99.5	100.2	97.78
3	103.3	102.3	101.4	100.2	99.8	99.0	99.0	98.1	99.2	99.2	98.9	99.1	99.03
4	104.0	103.5	102.0	101.0	99.4	98.0	99.0	98.8	99.0	99.0	99.8	96.5	98.85
5	102.8	104.0	103.0	101.8	100.5	99.0	99.1	99.1	99.0	96.8	98.1	98.7	98.73
6	104.0	104.0	103.0	102.0	100.9	99.8	99.0	99.0	99.1	99.1	99.0	99.0	99.24
7	107.1	108.1	106.2	104.8	104.0	104.2	101.7	100.0	99.2	98.0	90.0	96.0	99.34
8	105.2	104.0	102.0	104.0	103.2	99.2	101.1	99.1	96.0	98.1	97.0	96.4	99.51
9	104.0	104.9	104.1	101.0	100.8	99.4	99.0	98.4	97.7	86.0	92.1	97.5	98.73
10	104.0	105.3	105.0	103.0	100.5	99.0	99.0	98.5	98.7	98.6	97.3	98.7	99.46
11	104.8	106.3	105.1	101.3	102.3	102.4	102.1	96.0	97.5	96.0	96.7	98.8	99.11
12	103.0	104.5	105.0	98.0	102.7	87.0	96.1	99.0	93.2	94.0	95.9	101.0	97.73
13	101.5	104.0	103.0	102.7	101.2	101.1	100.1	99.1	98.4	97.6	96.1	101.0	98.72
14	102.4	102.0	101.4	100.6	100.0	99.7	99.0	97.6	94.6	99.0	99.0	99.0	98.76
15	101.6	103.0	103.1	102.6	102.0	100.4	99.1	99.0	99.0	99.1	99.0	98.6	99.15
16	103.0	104.0	105.5	105.0	104.4	103.8	101.8	100.6	97.3	98.4	100.0	99.2	100.08
17	108.2	107.0	105.0	104.8	104.0	102.6	100.3	99.0	98.0	98.2	98.6	95.0	101.34
18	103.0	103.1	102.7	101.0	99.9	99.1	99.0	99.1	99.0	99.3	99.0	99.4	99.10
19	104.5	103.4	102.1	101.0	99.6	99.4	99.1	99.1	99.1	99.2	99.1	99.0	99.49
20	105.2	104.5	103.4	101.1	100.1	99.0	97.0	98.1	99.0	96.1	100.0	98.4	99.43
21	103.6	103.7	102.1	101.3	100.2	97.4	98.5	99.6	96.1	98.3	97.2	98.7	98.75
22	102.0	102.1	100.4	99.3	100.0	97.6	98.6	98.4	97.6	98.8	97.7	98.0	98.48
23	105.0	103.4	102.1	101.1	98.7	98.9	98.2	98.1	99.0	99.1	99.1	99.0	99.38
24	102.7	103.2	100.6	100.0	98.6	98.2	99.0	99.1	99.0	99.1	98.3	98.6	99.12
25	106.6	105.6	102.9	100.8	99.1	98.0	98.1	98.3	98.4	98.5	98.3	98.2	99.76
26	103.2	103.0	102.0	101.0	100.5	99.7	98.9	99.0	99.0	99.1	99.0	99.0	99.12
27	102.4	104.0	104.0	102.4	100.7	99.3	98.3	96.5	96.0	98.2	98.6	98.0	98.10
28	105.0	104.0	102.0	101.0	99.0	98.3	98.3	98.6	98.2	96.7	96.9	98.9	98.61
29	102.9	103.9	102.3	100.9	99.3	98.4	98.3	98.6	98.0	97.0	97.5	97.0	98.40
30	104.6	104.1	102.1	100.7	99.6	98.8	99.0	98.5	97.0	97.8	98.0	98.0	98.82
Mean	103.87	104.08	102.98	101.56	100.71	99.16	98.61	98.28	97.98	97.68	97.60	98.34	98.99

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
May	'	'	'	'	'	'	'	'	'	'	'	'
1	98.0	97.7	97.6	97.1	97.1	95.8	94.0	94.1	95.4	98.0	101.1	102.6
2	98.0	97.9	97.3	97.2	96.4	95.1	94.0	94.0	97.1	99.9	101.5	103.2
3	98.0	95.0	97.0	95.4	97.0	94.7	94.3	94.7	99.8	99.5	104.6	106.8
4	98.2	97.1	99.2	96.0	95.2	94.1	93.0	93.5	95.0	94.0	100.5	104.0
5	97.2	99.0	99.0	98.8	97.7	95.6	94.1	93.0	95.2	100.0	104.0	105.4
6	98.1	97.6	96.2	95.1	95.3	96.0	99.1	96.0	96.2	106.0	104.0	106.0
7	98.0	97.0	97.5	97.3	96.0	93.5	94.0	94.0	96.0	100.5	104.0	106.0
8	96.9	99.5	99.0	95.5	96.0	95.0	94.0	94.0	98.0	101.5	103.7	104.1
9	96.0	97.2	96.0	98.0	95.3	95.1	93.4	94.0	96.0	97.0	101.0	104.0
10	97.0	101.2	96.0	97.8	96.2	96.0	95.0	94.1	95.2	99.0	101.8	104.0
11	98.0	97.2	97.5	98.0	97.0	96.2	93.5	93.0	93.0	96.0	102.0	104.0
12	98.0	97.0	96.8	97.0	97.0	97.0	96.0	96.0	96.6	99.0	100.0	103.0
13	98.6	98.0	97.9	96.6	95.2	94.8	93.4	94.0	97.0	100.2	101.0	105.0
14	89.0	95.4	97.0	100.8	90.0	91.0	91.0	102.0	95.0	98.5	105.5	108.6
15	100.0	98.0	96.6	101.0	94.0	96.0	105.0	101.0	114.0	98.2	101.0	107.0
16	100.5	96.0	97.0	103.0	98.0	98.0	97.0	94.0	96.2	101.0	101.4	103.5
17	100.0	100.0	99.0	98.5	97.7	96.2	95.2	94.4	96.4	98.4	102.0	103.0
18	103.7	104.3	99.1	98.8	99.2	98.0	95.8	95.2	97.0	98.4	101.0	103.0
19	98.4	96.0	97.7	99.5	97.3	96.0	94.7	98.6	99.1	99.7	106.0	107.8
20	99.8	101.2	99.0	97.8	99.0	96.1	94.2	95.0	97.0	101.0	104.1	106.1
21	104.0	101.8	100.0	101.0	100.0	97.3	96.4	95.0	95.2	97.6	101.5	105.0
22	100.0	99.8	99.4	100.7	97.5	96.0	94.6	95.1	99.0	103.0	106.4	107.0
23	100.0	99.8	100.0	99.2	98.0	97.3	95.0	95.1	97.0	101.0	101.0	102.0
24	98.0	98.0	98.2	97.8	98.0	100.5	98.0	95.0	96.3	100.2	103.0	105.0
25	98.8	98.4	98.0	98.2	97.0	95.2	94.8	94.0	96.0	99.0	102.3	103.5
26	99.0	98.8	98.5	98.2	97.3	96.0	97.0	97.0	92.6	94.0	98.0	101.0
27	94.8	98.0	98.0	99.1	96.6	95.5	94.5	94.0	94.6	97.4	100.6	101.6
28	99.0	94.1	96.1	93.4	99.0	98.0	95.1	94.0	91.0	93.1	97.0	100.0
29	97.3	98.0	97.1	97.8	94.8	90.0	94.1	93.0	93.0	97.0	101.0	103.0
30	98.6	99.8	99.4	98.0	98.0	95.0	94.0	95.0	95.0	99.0	102.0	104.8
31	98.3	100.0	98.4	97.0	94.8	94.3	93.3	95.1	97.4	101.1	103.0	103.0
Mean	98.36	98.35	97.92	98.05	96.38	95.65	95.08	95.06	96.53	98.97	102.13	104.29

Declination for the Month, 1891 May

for any hour added to the base-line value gives the absolute westerly declination at that hour

= 2° 29' 54''

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
May													
1	103.0	102.5	102.0	101.3	100.5	99.6	100.3	100.1	99.2	99.0	98.5	98.5	99.29
2	104.4	104.0	103.0	102.5	100.1	100.1	99.1	99.3	99.0	99.0	99.0	98.0	99.13
3	104.6	103.4	102.8	102.0	100.0	99.5	99.0	99.0	99.5	99.4	99.6	99.1	99.78
4	105.1	104.2	102.8	103.0	103.6	100.8	96.0	96.8	95.6	98.0	96.0	97.4	98.30
5	105.7	104.3	103.1	101.1	100.0	99.1	99.0	99.0	99.0	99.0	99.0	98.8	99.42
6	108.0	108.4	106.0	104.0	102.0	98.8	98.1	98.2	99.0	99.0	98.7	98.5	100.18
7	106.0	107.0	103.5	101.2	100.2	102.0	95.0	96.0	96.1	98.0	99.0	102.0	99.16
8	105.0	104.0	104.0	100.5	100.0	99.0	98.8	100.0	99.3	95.1	95.3	94.2	98.85
9	105.0	105.0	105.0	104.1	102.1	100.0	100.0	99.0	99.0	98.5	95.4	96.0	98.84
10	106.8	107.0	105.0	104.0	102.0	101.0	99.7	99.1	98.7	98.5	98.0	97.0	99.59
11	104.4	104.0	102.7	101.8*	101.0	99.0	99.0	100.0	99.0	96.5	97.1	97.6	98.65
12	104.0	104.8	103.6	101.5	101.0	100.0	100.0	99.0	99.0	98.7	99.0	98.0	99.25
13	107.1	107.3	103.0	101.5	101.3	97.1	98.0	92.0	88.1	91.1	89.0	94.0	97.55
14	112.2	109.0	108.5	104.5	102.0	101.0	99.0	82.3	82.0	90.0	95.0	99.2	97.85
15	103.0	102.7	104.0	105.8	104.0	103.0	101.0	104.0	103.5	100.0	99.0	100.0	101.74
16	107.0	97.0	103.8	103.8	103.7	102.0	97.4	101.0	102.0	100.5	98.2	100.8	100.12
17	102.0	101.7	102.1	102.0	100.6	100.0	92.0	94.5	97.1	96.0	104.0	100.5	98.89
18	103.2	104.0	104.3	102.2	100.8	99.6	98.0	98.3	98.9	99.6	100.0	96.0	99.93
19	106.4	105.0	102.7	100.6	99.1	97.0	98.9	99.0	96.0	93.0	96.7	98.3	99.31
20	107.1	107.0	104.5	102.0	100.3	99.2	100.2	100.9	100.8	97.7	96.7	99.3	100.25
21	107.0	106.0	106.0	105.0	103.0	100.0	101.0	101.1	100.8	100.8	101.0	100.8	101.14
22	107.3	106.0	105.8	102.8	100.7	99.3	98.3	98.2	98.8	99.0	101.0	99.0	100.61
23	104.5	104.4	102.6	100.8	99.0	96.8	95.8	97.7	97.3	97.3	99.0	96.9	99.06
24	105.6	105.0	103.0	101.8	99.3	99.0	99.0	98.5	98.7	99.0	98.7	98.8	99.77
25	103.8	103.0	101.4	100.0	99.0	98.4	98.0	98.1	98.2	98.8	99.0	99.0	98.83
26	104.0	104.1	104.0	102.1	99.5	97.6	98.0	98.3	97.2	96.7	96.0	98.0	98.45
27	102.0	102.3	102.8	102.3	101.0	99.4	98.2	99.6	99.0	98.6	98.6	98.0	98.60
28	102.5	103.6	103.1	103.1	100.6	97.5	89.0	89.2	92.0	93.1	94.0	93.1	95.86
29	102.0	101.4	101.8	101.0	101.0	98.0	98.0	98.2	98.1	96.0	92.2	97.6	97.56
30	106.0	106.3	103.8	102.0	100.8	98.0	97.8	95.0	99.4	99.1	98.7	98.3	99.32
31	103.7	104.0	103.1	101.2	99.1	98.3	98.9	99.0	99.0	99.2	99.0	99.1	99.14
Mean	105.11	104.47	103.67	102.31	100.88	99.36	98.08	97.76	97.72	97.56	97.75	98.12	99.15

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
June	'	'	'	'	'	'	'	'	'	'	'	'
1	98.8	99.0	99.0	98.0	97.0	96.6	94.5	96.0	96.3	97.8	100.0	101.3
2	97.8	97.8	97.0	97.0	96.2	96.0	95.2	95.7	98.0	99.3	101.6	102.8
3	96.2	97.4	97.0	96.8	95.0	94.0	92.8	95.1	96.0	97.1	100.1	101.0
4	97.0	94.8	92.0	95.0	94.0	95.0	94.0	95.1	96.7	97.1	100.0	101.5
5	97.0	95.2	96.0	94.3	94.8	95.2	94.0	94.8	95.8	96.8	100.7	101.7
6	98.0	100.0	96.0	96.0	96.2	96.3	94.7	95.0	95.0	95.1	99.0	100.6
7	99.0	99.8	99.0	98.1	97.6	97.9	96.0	95.6	95.7	97.6	100.0	101.8
8	101.2	97.0	97.8	97.0	96.2	95.9	94.0	93.0	93.0	94.9	98.2	102.0
9	98.2	98.0	97.8	97.4	96.8	95.4	95.0	93.5	94.0	95.1	97.2	100.5
10	98.4	98.3	98.2	98.0	97.0	96.3	94.0	94.1	95.0	95.1	96.0	98.2
11	99.0	99.0	98.4	98.1	97.6	96.0	94.6	94.8	96.1	98.2	100.0	102.6
12	98.2	98.3	98.1	97.7	96.6	95.7	94.1	93.2	93.2	96.1	99.6	101.0
13	98.5	98.5	98.0	97.8	97.1	95.8	93.2	93.1	96.0	98.0	101.0	103.6
14	98.0	99.0	97.0	95.6	94.8	90.9	88.5	89.7	98.2	99.1	100.0	103.6
15	99.0	98.8	99.0	99.0	97.8	96.0	96.0	94.3	95.6	99.0	102.0	102.0
16	97.8	100.5	99.4	99.2	100.0	99.0	97.8	96.8	95.0	93.2	94.0	96.1
17	99.0	99.0	99.2	99.0	99.0	96.0	93.2	92.2	93.0	93.2	95.8	97.5
18	96.8	98.0	98.0	97.0	96.6	95.6	93.8	95.3	96.1	97.5	99.5	101.2
19	97.1	98.0	96.2	98.1	97.0	94.1	94.0	94.0	94.0	95.0	100.0	101.0
20	97.0	102.2	96.0	95.5	95.3	93.3	92.1	91.0	91.6	95.5	97.5	101.7
21	100.3	101.5	100.1	99.5	98.4	97.7	95.8	96.0	97.0	97.4	101.0	104.0
22	98.1	99.7	99.8	101.0	98.9	97.1	95.8	94.2	94.1	96.2	100.1	102.0
23	98.2	98.0	98.0	97.2	96.7	93.3	90.5	91.4	93.8	97.5	99.5	103.4
24	97.3	97.3	97.8	95.1	95.0	93.0	92.1	91.4	90.4	94.0	96.0	99.2
25	96.2	96.9	96.0	96.0	98.5	96.8	93.5	91.0	89.0	90.5	94.0	97.8
26	95.6	97.0	96.8	97.0	98.0	95.0	94.0	94.0	94.7	94.9	96.1	99.1
27	95.5	93.5	98.8	97.4	95.1	94.4	95.0	91.6	94.1	94.5	98.8	99.3
28	97.4	97.0	96.6	96.5	95.1	93.0	92.0	91.6	92.8	95.0	97.5	101.0
29	97.2	97.1	96.6	96.1	95.6	94.1	92.5	91.5	91.5	95.5	100.2	102.5
30	97.5	97.6	97.1	96.5	95.4	93.5	92.2	91.6	92.5	94.8	97.5	99.5
Mean	97.84	98.14	97.56	97.23	96.64	95.29	93.83	93.55	94.47	96.03	98.76	100.98

Declination for the Month, 1891 June

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $= 2^{\circ} 31' 04''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
June	'	'	'	'	'	'	'	'	'	'	'	'	'
1	102.6	102.5	101.0	100.7	99.3	99.1	99.1	99.0	99.1	99.2	98.6	98.5	98.88
2	103.1	102.0	101.0	101.0	99.9	99.4	99.0	98.7	99.0	98.9	99.1	97.1	98.86
3	102.1	102.3	102.0	101.0	99.1	98.3	98.8	97.4	98.2	98.3	96.9	97.8	97.95
4	102.0	102.0	100.7	101.0	100.3	99.0	98.0	98.0	97.9	99.1	98.3	98.0	97.77
5	102.6	103.0	102.0	101.1	101.8	99.5	98.7	97.6	98.0	94.0	90.8	95.0	97.53
6	101.4	103.0	103.5	102.0	100.0	99.0	99.0	96.7	97.5	98.1	98.0	98.3	98.27
7	102.8	103.3	104.0	104.0	102.8	101.6	99.4	98.8	98.8	95.8	97.0	95.9	99.25
8	103.3	105.0	104.6	103.6	102.0	99.6	99.5	99.0	98.0	95.0	92.0	96.0	98.24
9	104.0	105.0	104.3	103.6	101.0	99.6	98.2	98.3	99.0	98.8	98.4	98.8	98.66
10	100.5	102.0	103.0	102.1	100.5	99.2	98.6	99.0	99.0	99.1	99.0	99.0	98.32
11	103.8	104.5	103.0	101.5	100.1	98.8	97.8	98.2	98.4	98.8	98.4	98.5	99.01
12	104.3	105.0	103.3	101.8	100.0	99.0	98.1	98.0	98.2	98.0	98.0	98.3	98.49
13	104.0	103.5	102.0	100.0	99.8	97.7	95.8	94.2	94.1	94.4	95.9	96.8	97.87
14	104.6	106.2	106.8	106.1	100.4	100.0	99.0	99.4	98.0	98.7	98.2	98.8	98.78
15	.	102.0	101.0	101.2	100.5	100.3	99.0	98.0	97.0	98.0	98.0	97.8	98.75
16	98.0	99.6	102.0	99.3	97.0	98.0	96.8	97.5	97.0	97.4	98.6	99.0	97.88
17	101.7	103.3	103.1	101.3	99.5	97.9	97.5	98.6	98.2	98.6	98.3	97.8	98.45
18	102.1	103.2	102.9	100.3	98.8	98.0	98.7	98.4	98.3	98.4	98.1	99.0	98.40
19	101.0	100.8	100.8	99.5	98.2	96.8	97.1	97.8	97.0	92.8	95.8	97.8	97.25
20	105.0	106.0	104.8	102.8	100.8	98.7	98.7	99.0	99.2	98.1	99.3	100.0	97.96
21	105.7	107.0	105.1	104.4	102.1	99.3	98.7	99.0	99.8	99.8	99.0	98.6	100.30
22	101.8	103.3	102.9	101.3	100.0	98.9	97.9	98.0	97.1	97.5	97.9	98.0	98.86
23	105.0	103.9	102.0	100.7	98.4	98.0	96.1	97.2	96.9	97.0	98.4	98.0	97.88
24	101.0	101.2	101.6	101.1	100.0	99.0	98.0	97.6	94.2	97.8	97.3	97.1	96.85
25	100.1	102.0	101.2	99.6	98.9	98.0	97.0	97.9	97.9	97.9	96.1	97.8	96.69
26	100.7	103.0	101.4	101.1	99.7	98.1	96.8	94.5	95.0	95.9	95.4	94.6	97.02
27	100.7	100.3	101.1	99.0	98.1	97.9	97.5	97.2	97.7	97.2	97.0	97.3	97.04
28	102.2	101.6	100.9	99.9	99.0	98.0	96.9	97.9	96.1	97.4	97.6	97.3	97.10
29	103.5	102.0	100.2	98.1	96.8	96.4	96.7	97.2	97.6	97.2	96.7	96.5	96.80
30	101.2	102.2	101.7	100.8	98.5	97.0	96.0	97.8	97.9	97.8	97.0	96.2	97.08
Mean	102.44	103.02	102.46	101.33	99.78	98.66	97.95	97.86	97.67	97.50	97.30	97.67	98.08

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
July	/	/	/	/	/	/	/	/	/	/	/	/
1	97.2	97.1	96.3	95.8	94.4	92.4	90.4	89.4	91.7	96.3	99.1	102.2
2	97.4	96.7	97.2	96.5	93.6	92.6	91.4	90.2	90.4	93.5	98.5	102.0
3	97.7	97.5	97.1	96.4	95.3	93.9	91.3	89.5	90.2	91.4	97.2	101.0
4	98.0	97.5	96.4	96.3	93.5	92.5	90.9	90.1	91.3	94.6	98.9	101.5
5	97.5	96.7	96.4	96.1	94.7	93.5	92.0	92.0	93.5	95.6	98.9	101.4
6	97.6	97.5	97.6	95.5	93.6	92.5	90.3	91.6	92.4	96.2	101.6	103.1
7	98.3	97.0	98.1	97.5	96.6	93.3	91.8	92.5	90.8	92.4	97.6	100.6
8	97.8	98.1	97.6	97.5	96.6	91.5	93.3	91.5	91.6	93.6	98.5	101.4
9	97.8	98.3	98.0	98.5	98.3	95.5	93.2	92.3	92.1	95.0	99.5	102.8
10	96.8	98.6	96.0	96.4	96.3	93.7	93.8	93.5	94.4	96.2	98.6	100.5
11	97.7	98.4	98.0	97.3	96.7	94.7	93.3	92.2	92.2	93.7	97.2	100.2
12	97.5	97.3	98.4	97.5	95.7	94.3	92.4	91.6	92.5	94.3	96.0	97.5
13	97.7	98.0	96.7	97.4	96.7	95.5	93.5	92.4	93.5	95.3	98.8	101.6
14	96.5	96.5	94.5	95.5	93.5	93.5	93.4	93.7	95.0	96.8	100.5	102.6
15	98.5	97.8	99.0	98.4	97.5	95.7	94.6	93.6	92.8	93.6	97.4	99.7
16	97.7	97.7	97.8	98.0	97.4	95.4	94.5	91.7	93.4	96.5	97.5	101.0
17	93.5	94.8	92.8	89.5	90.7	91.5	94.0	88.7	96.0	98.5	97.5	102.7
18	98.1	97.5	97.5	96.6	95.9	94.6	92.5	92.5	93.0	95.1	97.5	99.1
19	97.1	98.0	97.9	97.8	96.4	95.0	93.2	92.8	93.7	95.5	99.0	102.2
20	96.5	97.9	96.7	97.7	95.0	95.6	92.8	91.3	93.8	96.0	99.5	102.0
21	97.8	97.2	96.7	97.1	96.3	95.0	92.8	93.8	93.3	94.5	98.0	101.0
22	97.3	97.1	96.3	96.0	95.6	93.9	92.8	91.3	91.1	93.6	96.8	100.0
23	97.1	97.1	98.7	98.0	96.9	94.3	93.5	92.8	91.7	91.7	97.0	99.3
24	97.0	96.6	96.5	95.2	96.7	92.4	90.6	88.4	95.8	93.7	96.6	100.5
25	101.6	97.2	96.0	97.0	95.0	93.0	90.2	91.0	92.5	91.8	97.1	100.0
26	97.1	97.7	97.1	97.1	96.1	94.3	93.3	92.4	93.7	96.2	98.7	100.5
27	97.3	97.1	97.3	96.7	96.0	94.3	92.5	91.5	91.6	93.5	95.5	97.5
28	97.1	97.5	96.7	96.4	95.8	94.5	93.0	91.0	89.4	92.5	96.1	99.3
29	97.5	97.6	97.3	97.2	96.3	94.4	92.3	91.4	91.0	93.2	97.8	99.5
30	96.8	96.8	96.8	96.2	96.0	94.6	93.5	91.8	91.8	93.2	95.0	97.5
31	97.8	98.8	98.2	97.3	96.3	94.1	92.8	90.3	91.0	93.0	96.4	99.1
Mean	97.46	97.41	97.01	96.66	95.66	94.03	92.58	91.57	92.49	94.42	97.88	100.62

Declination for the Month, 1891 July

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $= 2^{\circ} 31' 50''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
July													
1	102.5	103.6	102.5	101.5	99.2	96.0	95.4	95.5	95.5	93.4	96.6	96.4	96.68
2	103.6	104.3	104.7	102.8	100.0	98.3	97.5	98.4	97.3	94.7	95.5	98.0	97.30
3	103.5	104.5	104.5	104.5	103.7	101.7	103.5	88.5	93.4	98.5	98.6	98.3	97.57
4	102.5	102.0	101.2	100.0	98.8	98.2	98.0	98.2	97.9	98.1	98.1	97.5	97.17
5	101.1	100.5	100.2	100.0	99.5	98.6	98.4	97.6	97.6	97.1	96.0	97.3	97.18
6	104.5	106.0	103.6	101.5	101.5	98.4	97.5	97.5	97.2	89.3	96.6	98.5	97.57
7	101.8	101.1	100.2	100.0	98.0	97.2	96.4	96.5	97.4	97.0	97.4	97.6	96.96
8	101.8	102.4	101.6	100.0	98.6	98.0	97.6	97.1	97.6	97.6	97.9	97.8	97.50
9	105.0	105.7	104.8	102.8	99.5	97.3	96.8	95.7	97.3	97.6	98.4	96.1	98.26
10	103.6	104.0	103.8	101.8	99.0	97.2	96.7	96.8	97.1	97.0	96.8	97.3	97.75
11	103.2	104.5	103.5	102.5	99.5	97.3	96.5	97.3	97.6	97.5	97.4	97.3	97.74
12	100.0	101.4	102.8	102.7	100.0	97.7	96.7	97.4	97.6	97.5	97.9	97.8	97.27
13	101.2	100.9	101.4	101.3	100.0	98.4	97.5	98.4	97.5	96.5	97.5	94.5	97.63
14	102.4	101.0	99.2	97.8	96.0	95.5	95.7	96.4	96.6	95.5	97.5	98.4	96.83
15	100.5	101.5	100.4	99.0	97.6	96.6	97.2	97.1	97.5	97.6	97.6	97.8	97.46
16	102.0	101.5	101.3	100.2	99.7	98.2	95.0	90.8	94.5	91.6	95.4	97.0	96.91
17	99.6	100.7	99.7	98.6	97.5	96.6	97.5	96.3	97.5	95.0	97.0	97.8	96.00
18	102.3	103.4	103.0	101.9	99.0	97.8	97.9	97.9	97.3	96.1	97.5	96.6	97.53
19	105.0	105.5	104.2	101.5	100.0	98.2	97.2	97.0	97.2	97.8	98.0	97.8	98.25
20	103.8	104.0	103.0	101.0	98.7	97.6	96.3	96.1	95.2	97.0	97.8	98.0	97.64
21	103.0	103.2	102.0	100.0	98.2	97.7	97.7	97.8	98.0	98.0	98.0	98.0	97.71
22	103.7	105.1	104.5	102.6	100.0	97.7	97.0	97.5	97.3	97.2	96.3	97.2	97.41
23	101.5	102.2	102.4	101.5	98.8	97.4	97.1	97.4	97.7	97.0	97.0	96.7	97.28
24	103.6	108.0	105.5	101.8	98.8	97.0	98.8	97.0	99.0	96.0	96.1	96.5	97.42
25	101.2	101.3	100.7	100.2	98.7	98.1	97.6	95.5	95.7	96.7	97.2	97.4	96.78
26	102.0	102.5	102.1	100.3	99.0	97.7	97.8	97.5	97.9	97.0	95.7	96.2	97.50
27	101.5	103.0	103.0	101.6	100.6	99.0	97.8	95.6	97.4	96.1	93.5	96.3	97.34
28	102.0	104.0	103.7	102.8	101.6	100.2	98.8	98.2	98.0	98.0	98.0	97.8	97.60
29	100.8	101.3	102.2	101.0	99.3	98.5	98.1	98.0	97.6	97.7	96.9	96.9	97.24
30	101.6	103.0	103.0	102.0	100.3	98.3	97.6	97.8	97.8	97.1	97.3	97.8	97.22
31	101.3	102.9	103.0	102.1	100.4	98.7	98.0	98.4	98.0	98.0	98.0	98.0	97.58
Mean	102.26	103.06	102.51	101.20	99.40	97.91	97.47	96.68	97.14	96.49	97.08	97.31	97.35

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
August	'	'	'	'	'	'	'	'	'	'	'	'
1	97.7	97.3	97.0	96.4	95.9	94.1	92.7	91.9	93.0	95.2	98.7	101.0
2	97.2	97.0	97.7	97.2	98.8	95.8	92.0	88.7	90.3	93.8	97.7	99.0
3	97.0	98.0	102.9	94.0	94.5	107.0	91.0	90.0	91.0	96.4	97.7	102.0
4	95.0	97.9	99.0	102.9	97.2	93.2	91.9	90.3	92.0	95.1	99.2	101.2
5	96.2	101.0	97.1	98.2	97.9	95.0	92.7	92.8	94.4	96.4	99.0	100.0
6	97.3	97.1	97.8	99.0	96.0	94.0	92.7	91.7	93.2	96.0	100.6	102.3
7	98.0	97.9	97.3	97.6	96.0	94.0	92.0	92.3	95.3	98.0	100.7	102.0
8	97.0	97.2	97.3	99.0	96.8	93.3	90.9	89.0	90.6	94.0	98.8	101.3
9	98.0	97.8	97.3	96.9	95.6	92.8	91.9	90.0	90.6	93.0	100.3	104.3
10	97.3	98.0	99.9	98.9	98.8	98.2	94.0	90.4	91.5	94.0	98.6	102.7
11	94.7	98.5	97.0	97.9	98.0	94.8	94.3	96.0	96.0	96.0	97.8	100.3
12	97.8	97.7	97.2	97.8	98.3	98.1	94.1	93.0	93.8	96.3	101.8	102.3
13	94.8	96.0	97.1	101.7	95.8	92.7	92.0	91.7	93.2	95.5	99.3	102.2
14	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
15	98.6	98.0	99.0	100.1	98.3	95.3	96.0	94.7	94.7	96.6	101.2	102.6
16	97.4	97.3	97.9	96.9	95.8	93.7	93.2	90.3	92.8	98.6	103.7	105.6
17	100.0	98.7	99.2	100.8	97.1	95.5	93.5	93.4	94.8	98.6	103.4	104.2
18	98.4	98.1	98.5	97.4	96.7	94.3	91.9	91.5	94.6	98.5	102.5	104.5
19	98.1	98.0	97.3	96.6	96.3	93.1	90.6	89.1	89.5	93.5	97.6	101.0
20	98.5	98.5	98.3	98.6	96.1	94.0	91.1	89.8	93.3	98.7	100.7	102.8
21	98.4	98.3	97.8	97.0	96.1	94.2	91.3	88.5	93.3	98.7	103.7	105.1
22	96.6	97.4	97.9	96.8	96.0	94.2	92.6	91.8	91.4	94.6	98.9	101.5
23	97.9	97.6	97.4	97.0	96.1	94.5	93.1	92.1	93.8	97.9	102.0	103.9
24	97.4	97.9	97.6	96.6	96.3	94.7	93.3	92.0	92.6	96.1	101.1	105.6
25	98.0	97.7	97.0	96.5	96.0	94.2	91.2	90.1	91.0	93.8	97.1	99.3
26	96.9	96.7	97.5	96.8	96.0	94.0	93.7	93.2	93.8	97.1	101.5	103.7
27	98.6	98.4	98.0	97.7	97.3	95.5	93.1	93.0	94.0	97.3	101.0	103.9
28	98.2	98.0	97.8	97.3	97.0	95.9	93.4	93.0	93.8	96.0	100.2	104.1
29	92.5	89.1	92.5	91.0	103.5	92.4	91.5	92.5	98.5	102.3	99.1	106.9
30	98.6	100.0	101.0	98.6	95.8	94.2	94.7	94.0	96.9	100.2	103.7	105.0
31	98.0	100.7	96.9	103.8	99.0	96.6	91.9	93.6	96.3	99.7	101.6	103.5
Mean	97.34	97.73	97.87	97.90	96.97	94.98	92.61	91.68	93.33	96.26	100.31	102.79

Declination for the Month, 1891 August

for any hour added to the base-line value gives the absolute westerly declination at that hour

= 2° 31' 50''

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
August	'	'	'	'	'	'	'	'	'	'	'	'	'
1	101.7	103.0	102.1	101.3	102.1	100.2	100.0	99.1	98.3	98.1	97.7	97.8	98.01
2	101.8	104.0	106.8	103.5	100.2	99.0	95.7	94.2	98.1	98.0	95.1	93.7	97.30
3	101.8	102.0	100.1	101.0	100.0	95.0	96.8	97.1	98.0	96.0	96.3	96.1	97.57
4	104.0	104.7	103.2	101.6	98.8	97.7	97.5	97.9	97.3	97.0	99.0	98.9	98.02
5	100.8	102.0	101.2	100.0	98.9	97.2	97.2	97.8	98.0	97.8	98.0	97.9	97.81
6	102.8	103.7	102.0	100.8	98.0	96.7	97.0	97.9	97.0	97.0	97.2	98.0	97.74
7	103.6	104.6	103.0	100.0	97.6	95.8	95.0	95.8	95.0	93.0	94.1	96.0	97.28
8	103.0	104.1	103.5	101.0	99.0	97.6	96.6	92.8	96.2	97.9	97.7	97.7	97.18
9	106.3	104.1	102.0	100.8	99.1	98.0	96.1	96.4	93.0	97.0	96.2	97.0	97.27
10	104.7	103.8	102.7	100.6	99.2	98.3	98.0	97.7	96.9	94.8	93.6	95.0	97.82
11	101.3	102.2	101.2	100.0	99.0	98.0	97.7	97.9	96.0	97.2	97.5	96.5	97.74
12	104.6	103.6	102.7	101.3	98.7	97.3	97.3	92.6	95.1	96.0	95.8	96.5	97.90
13	.	.	.	.	.	.	.	.	.	.	.	.	} 97.30
14	103.8	102.0	100.4	100.1	100.0	97.4	95.0	96.0	97.0	97.2	95.2	99.0	
15	103.7	105.2	104.2	101.8	99.8	97.8	98.1	98.6	98.8	95.3	94.8	98.0	98.80
16	105.7	106.3	101.2	100.7	100.0	98.6	98.0	95.3	93.7	95.2	94.5	93.9	97.76
17	103.8	102.9	101.5	99.6	97.8	96.7	97.1	97.3	98.1	98.5	97.6	97.9	98.67
18	104.7	103.6	101.4	99.3	97.5	96.9	98.1	98.6	98.3	98.6	98.3	98.4	98.36
19	104.5	105.8	105.2	102.5	98.0	97.4	98.5	97.3	99.0	98.9	98.0	96.0	97.58
20	103.5	103.5	102.0	100.2	98.3	97.0	97.3	98.4	98.3	98.4	98.0	98.0	98.05
21	106.0	106.0	103.3	101.6	101.0	93.5	97.6	98.7	99.1	98.4	97.3	98.0	98.45
22	103.5	103.3	102.0	100.3	98.9	98.0	98.2	98.1	98.1	98.1	98.0	97.8	97.67
23	104.5	103.9	102.3	100.5	98.6	97.6	98.1	98.0	97.9	98.0	97.2	96.8	98.20
24	106.9	104.9	102.2	99.9	98.4	97.6	98.1	95.8	94.8	97.7	98.2	98.0	98.07
25	102.5	104.0	103.4	102.0	100.6	98.9	98.5	97.4	98.4	98.5	98.3	98.0	97.60
26	104.8	106.0	105.8	102.7	100.2	99.1	99.5	99.1	98.9	97.9	96.8	98.7	98.77
27	104.6	104.2	102.1	101.0	99.7	99.6	99.6	99.2	98.9	98.8	98.9	98.6	98.88
28	105.3	105.1	103.0	100.7	101.0	100.0	99.6	99.3	98.5	82.5	89.6	85.5	97.28
29	103.6	100.4	98.1	100.4	99.3	96.5	88.0	99.0	99.0	84.8	97.0	94.0	96.33
30	105.8	105.1	103.0	101.7	99.0	98.4	98.5	97.0	98.3	98.0	98.0	98.8	99.35
31	103.9	103.1	101.3	99.1	97.9	98.0	92.7	97.0	98.0	95.0	97.3	99.2	98.48
Mean	103.92	103.90	102.43	100.87	99.22	97.66	97.18	97.24	97.40	96.32	96.71	96.86	97.90

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Sept.	/	/	/	/	/	/	/	/	/	/	/	/
1	102.0	98.5	98.9	97.7	98.0	100.7	93.8	98.0	101.0	101.3	105.5	107.0
2	96.0	98.0	101.0	96.1	95.6	97.0	94.0	92.5	96.2	97.9	102.0	103.3
3	99.0	99.2	98.3	98.0	97.0	95.7	92.5	92.1	94.1	97.1	102.2	104.6
4	98.2	107.4	96.1	95.1	93.0	93.0	91.7	92.0	94.3	99.0	105.0	106.0
5	99.0	98.4	98.2	97.7	96.7	98.0	94.1	93.0	95.7	98.9	103.2	105.8
6	99.0	98.8	98.6	98.9	98.8	96.2	93.0	92.9	94.5	98.2	101.7	105.9
7	99.7	99.1	99.2	98.1	99.0	96.3	93.0	92.1	93.3	96.7	100.8	103.9
8	99.0	99.0	98.9	98.4	98.0	96.7	94.0	93.1	94.2	96.8	100.1	103.7
9	97.0	97.0	97.2	96.8	96.3	95.1	96.3	102.0	100.0	102.0	104.1	104.7
10	96.3	90.5	97.5	91.0	96.4	91.6	94.2	91.7	96.6	101.8	104.4	109.0
11	98.4	97.2	96.5	96.7	106.4	97.3	95.5	100.5	98.6	99.6	101.7	105.0
12	96.5	97.0	99.5	98.5	97.4	95.0	94.2	95.1	97.4	99.5	102.5	103.7
13	99.6	99.5	99.2	98.7	98.6	98.1	97.5	97.7	98.2	99.0	100.5	101.4
14	99.3	98.7	98.3	98.5	98.4	97.4	95.4	94.7	94.5	97.6	99.6	101.3
15	99.1	98.0	96.5	96.6	101.6	102.4	101.6	98.6	99.1	99.8	103.3	106.0
16	99.1	98.7	98.4	97.9	97.8	96.9	95.6	96.0	96.9	99.6	102.2	104.5
17	99.0	97.5	97.1	94.4	97.3	99.0	95.0	95.5	97.5	100.5	104.2	106.8
18	100.3	99.0	99.0	99.0	100.0	97.4	95.2	95.1	96.6	100.5	104.6	107.6
19	100.0	99.3	99.2	98.7	98.7	97.9	95.7	95.1	96.0	98.1	102.8	106.1
20	99.0	97.6	96.8	96.8	97.7	97.4	95.7	95.5	95.5	97.4	101.4	103.8
21	100.4	99.2	99.2	98.5	97.7	97.3	95.2	92.7	95.5	96.4	100.6	103.7
22	.	.	.	.	.	.	.	.	.	.	.	.
23	100.0	98.7	98.4	96.6	98.1	97.7	98.5	98.0	101.5	101.0	104.6	106.4
24	99.6	96.5	98.5	97.8	97.8	97.3	95.0	95.0	95.0	98.6	101.6	104.2
25	99.4	99.3	99.2	99.3	98.6	97.5	95.5	94.8	95.0	96.5	98.4	100.6
26	96.0	98.0	90.8	92.8	94.5	98.5	100.9	99.0	97.5	102.0	100.6	105.0
27	99.9	100.0	99.0	99.0	98.6	100.7	96.6	96.2	96.2	98.5	100.5	103.4
28	100.3	97.4	98.0	97.2	96.7	97.5	108.8	109.0	105.0	102.6	107.3	106.5
29	98.8	97.0	102.3	99.2	97.0	102.7	105.0	98.6	95.2	99.2	101.2	103.8
30	96.5	96.5	96.3	96.5	100.0	104.2	106.5	99.5	98.6	100.2	101.5	104.5
Mean	98.84	98.31	98.14	97.26	97.99	97.67	96.55	96.07	96.89	99.18	102.35	104.77

Declination for the Month, 1891 September

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $= 2^{\circ} 30' 38''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Sept.	/	/	/	/	/	/	/	/	/	/	/	/	/
1	110.0	107.0	103.9	100.5	98.5	97.0	97.8	91.8	93.7	97.9	92.3	94.5	99.47
2	104.2	105.8	104.7	101.0	99.2	99.1	99.0	98.0	97.5	95.8	98.4	99.3	98.82
3	107.3	106.8	104.1	101.5	100.7	91.4	99.5	93.0	86.0	91.9	95.3	95.8	97.63
4	104.9	104.7	102.3	99.9	98.8	98.3	99.2	99.0	96.3	99.8	99.2	99.2	98.85
5	105.9	105.0	103.7	101.8	99.9	99.7	99.7	99.3	99.0	99.1	99.0	99.1	99.62
6	107.9	106.8	104.0	101.7	99.7	98.1	98.1	99.5	99.2	99.1	98.2	99.9	99.53
7	105.6	104.3	101.7	99.5	98.4	98.5	99.0	99.3	99.2	99.2	99.2	99.1	98.92
8	105.6	105.9	103.0	101.2	99.3	100.0	101.5	96.6	98.5	96.2	94.8	100.0	98.94
9	104.2	103.0	101.3	100.7	102.2	100.8	71.8	94.8	77.5	89.2	92.6	98.0	96.86
10	112.3	108.3	107.5	106.6	105.2	102.0	97.1	103.0	99.4	101.5	98.5	96.5	99.95
11	105.5	101.5	109.5	99.0	105.5	100.9	99.0	99.7	99.2	97.5	90.4	86.6	99.49
12	104.2	104.4	103.7	102.7	101.8	101.5	100.8	100.5	100.3	100.3	100.1	100.0	99.86
13	102.2	102.4	101.8	100.5	100.5	99.6	97.5	98.5	95.1	99.0	99.5	99.4	99.33
14	102.5	104.7	102.7	102.5	96.5	101.5	100.6	100.3	100.1	99.9	99.4	99.0	99.31
15	104.5	103.6	102.5	101.5	100.1	101.0	100.4	101.1	100.4	99.8	99.6	99.5	100.69
16	104.0	103.7	101.5	101.6	96.5	98.4	101.4	100.3	100.0	100.0	98.1	98.8	99.50
17	105.2	104.3	102.4	100.4	99.7	100.3	100.7	100.4	100.6	100.4	100.4	100.9	99.98
18	107.9	106.0	103.2	101.1	99.6	99.8	100.8	99.4	99.2	100.3	100.6	100.4	100.53
19	108.0	106.5	104.7	102.3	100.5	100.5	100.7	100.4	100.2	100.1	100.0	100.0	100.48
20	104.5	104.9	103.8	102.0	100.8	100.4	102.3	103.8	100.5	100.1	96.2	100.6	99.77
21	107.6	108.5	107.5	104.2	102.5	100.7	100.7	100.3	100.0	100.1	100.0	.	100.37
22	107.3	107.5	104.9	103.7	101.7	101.6	101.3	100.8	100.3	100.1	100.1	100.0	102.44
23	106.4	106.6	105.8	104.0	102.0	101.4	100.6	102.0	100.3	100.0	100.8	98.5	101.18
24	106.4	105.4	103.5	102.5	101.7	97.5	98.5	97.9	100.0	99.5	99.9	99.7	99.56
25	103.0	103.4	102.8	102.0	101.6	101.8	101.0	100.5	99.2	99.3	99.0	98.5	99.43
26	105.4	105.5	104.0	102.3	98.4	101.0	97.5	97.0	98.8	99.0	98.9	99.6	99.29
27	104.5	103.7	102.0	100.9	101.0	101.5	99.6	98.6	98.8	95.0	101.0	102.6	99.91
28	106.0	101.5	102.5	100.5	84.0	99.5	100.8	99.0	96.4	95.8	100.4	103.8	100.69
29	104.0	102.3	101.0	99.7	98.4	99.5	100.0	99.8	99.4	98.8	98.0	95.3	99.84
30	102.2	101.5	100.2	99.6	99.0	97.8	96.2	100.0	100.0	100.2	96.3	94.9	99.53
Mean	105.64	104.85	103.54	101.58	99.79	99.70	98.77	99.15	97.84	98.50	98.21	98.60	99.59

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
October	'	'	'	'	'	'	'	'	'	'	'	'
1	103.0	99.0	99.0	102.3	100.3	100.3	100.8	96.7	99.8	99.9	102.5	104.0
2	96.7	95.0	98.8	99.3	99.0	105.5	100.0	97.3	97.4	99.4	100.4	104.0
3	97.8	98.8	100.6	104.0	100.5	100.0	101.2	95.8	95.0	97.0	99.8	104.0
4	99.0	100.0	99.8	99.8	99.2	99.2	96.8	95.2	95.5	98.0	100.2	104.0
5	100.0	100.0	100.0	101.7	100.2	99.6	97.8	96.0	94.0	93.8	97.0	101.3
6	100.0	100.0	101.0	101.0	101.0	99.2	96.4	94.8	94.0	96.0	99.0	102.9
7	100.1	99.2	99.4	99.2	98.2	98.5	99.5	97.4	94.0	94.4	101.4	104.2
8	97.0	96.4	96.8	97.5	97.8	97.2	94.5	91.0	91.0	94.0	96.5	101.4
9	93.0	99.0	95.5	96.5	98.5	98.5	95.5	92.8	94.2	95.5	100.0	103.0
10	94.5	91.0	94.8	99.2	106.5	105.8	98.7	95.5	95.5	96.5	100.8	104.0
11	100.2	99.7	99.6	99.6	99.8	99.2	98.0	96.3	96.0	93.0	99.8	103.0
12	99.0	99.1	99.2	98.2	98.5	98.0	98.5	96.8	95.2	97.0	99.0	103.0
13	95.0	96.1	99.4	98.2	101.5	99.4	97.5	96.2	96.3	96.5	99.3	101.6
14	99.4	99.0	99.0	99.8	99.4	99.2	98.7	97.0	98.2	97.2	99.1	100.5
15	99.8	100.0	99.2	100.0	100.3	99.8	98.4	97.3	97.0	97.2	99.3	102.2
16	100.1	100.2	100.0	99.9	99.6	99.4	98.5	97.3	97.1	98.0	100.0	101.2
17	99.8	99.8	99.2	99.2	99.0	98.9	97.3	96.1	96.1	97.0	99.9	102.2
18	100.9	98.6	99.1	99.1	99.3	99.0	97.3	95.2	94.6	96.5	101.0	104.5
19	101.0	100.3	99.2	99.8	98.5	99.2	97.7	94.3	94.7	98.3	101.1	104.2
20	99.2	106.2	103.2	102.0	98.2	98.9	97.5	94.6	94.1	96.0	99.0	102.0
21	102.1	100.0	100.2	100.7	100.0	99.3	97.1	96.2	96.0	97.3	100.8	101.2
22	100.8	100.6	101.0	100.9	100.0	100.0	98.5	96.5	95.9	97.5	100.7	101.0
23	100.8	101.2	100.3	100.2	99.9	103.1	97.2	96.0	96.0	96.0	.	103.8
24	107.5	103.7	97.7	104.9	98.7	100.0	102.5	98.6	104.5	102.0	103.0	104.2
25	95.5	98.5	102.2	104.2	99.5	99.0	98.9	99.5	100.5	98.2	97.1	100.5
26	.	.	.	.	.	.	.	.	.	.	.	.
27	100.3	102.3	100.7	101.0	100.0	103.5	101.0	99.8	96.0	97.0	99.5	102.5
28	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.
Mean	99.33	99.37	99.42	100.32	99.75	99.99	98.18	96.16	96.10	96.89	99.85	102.71

Declination for the Month, 1891 October

for any hour added to the base-line value gives the absolute westerly declination for that hour

= 2° 30' 38"

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
October	/	/	/	/	/	/	/	/	/	/	/	/	/
1	105.4	104.5	102.5	100.0	98.2	100.3	99.5	99.5	100.6	98.7	100.2	98.5	100.65
2	102.6	103.0	102.4	101.0	100.5	99.5	97.2	100.0	99.3	99.0	101.0	99.0	99.85
3	104.0	104.0	102.8	101.5	101.0	100.0	100.0	100.0	99.0	100.3	99.7	98.7	100.23
4	105.5	105.0	104.0	102.5	101.0	100.0	99.2	99.7	100.0	98.0	99.0	99.0	99.98
5	103.5	104.5	104.0	102.8	100.8	99.8	100.6	100.0	99.8	97.1	99.0	100.0	99.72
6	104.0	104.5	102.8	101.5	100.0	100.5	100.4	100.2	99.8	100.4	100.0	100.0	99.97
7	106.6	105.2	103.7	101.6	99.6	99.0	99.0	99.2	99.0	98.5	97.5	97.5	99.04
8	105.0	105.7	106.0	102.8	104.7	101.5	101.5	100.8	99.6	100.2	100.0	92.7	98.82
9	104.2	105.2	104.0	102.5	101.3	100.9	100.0	100.5	100.3	93.0	97.8	98.0	98.75
10	104.8	104.6	103.2	102.0	101.5	101.4	101.4	101.4	101.0	100.5	100.8	102.0	100.31
11	104.6	104.5	103.4	102.8	102.0	101.5	100.4	100.5	100.2	100.5	100.2	100.1	100.20
12	107.3	107.4	105.2	104.5	100.5	104.0	104.2	101.3	100.3	94.5	99.2	100.0	100.42
13	103.6	103.0	104.5	101.0	101.5	101.5	100.2	100.6	100.2	100.0	99.8	100.2	99.71
14	102.1	103.2	103.0	102.4	102.0	98.5	101.0	101.0	100.5	99.5	99.6	99.1	100.00
15	103.8	104.2	103.4	102.0	101.4	101.2	100.7	100.3	100.4	100.0	100.5	100.0	100.35
16	103.0	103.4	102.3	101.7	101.2	101.2	99.9	101.0	99.9	100.0	99.6	100.0	100.19
17	103.9	103.7	102.5	101.4	101.1	101.0	100.0	100.0	100.0	100.0	100.0	100.0	99.92
18	106.3	105.3	104.1	103.6	105.3	102.9	97.0	100.5	97.0	99.2	99.0	102.0	100.30
19	105.4	105.8	104.8	104.2	95.5	105.2	102.1	98.9	99.0	99.7	97.6	98.6	100.21
20	104.0	104.0	104.4	105.0	101.0	101.3	101.0	97.2	96.0	101.1	100.0	101.0	100.29
21	. .	. .	. .	. .	. .	. .	99.8	100.4	100.4	100.2	100.3	100.3	99.57
22	104.0	104.4	103.5	102.0	101.2	101.0	100.6	101.1	100.2	100.0	98.0	99.0	100.31
23	105.0	105.2	104.8	104.5	93.5	105.4	102.3	100.8	98.0	90.0	98.4	99.0	100.07
24	104.0	107.6	105.0	99.8	100.3	99.5	93.0	96.0	99.6	92.0	102.2	96.5	100.95
25	. .	. .	. .	. .	. .	. .	99.0	97.2	97.5	100.0	99.6	96.4	99.07
26	104.0	104.2	104.9	103.3	100.8	101.5	96.7	99.4	98.4	99.9	101.0	101.2	101.27
27	103.1	104.8	104.8	102.3	. .	. .	. .	. .	. .	. .	. .	. .	100.30
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
30	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
31	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Mean	104.39	104.69	103.84	102.35	100.66	101.19	99.87	99.90	99.46	98.55	99.62	99.18	100.07

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Nov.	'	'	'	'	'	'	'	'	'	'	'	'
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
4	49.4	49.0	49.9	49.2	47.5	47.5	47.5	44.3	44.2	46.5	49.3	53.3
5	46.2	47.5	48.3	48.5	45.9	45.3	44.3	43.3	44.0	46.0	49.1	52.0
6	48.0	49.0	48.8	48.2	47.8	47.8	46.7	45.2	44.0	45.0	48.0	50.9
7	47.0	47.0	47.2	46.5	46.3	46.3	45.3	44.3	44.0	46.3	48.9	52.0
8	47.8	48.0	48.0	47.2	47.4	47.0	45.2	44.0	45.0	45.2	46.0	49.0
9	48.1	48.3	48.9	47.3	47.9	46.9	46.2	44.8	44.4	45.3	46.9	49.4
10	47.9	48.0	48.5	48.0	47.6	47.5	46.6	44.6	45.2	43.9	46.3	50.9
11	48.1	47.8	48.0	48.3	47.5	47.7	46.6	45.0	45.3	45.2	47.4	50.0
12	48.8	49.3	48.6	48.4	48.0	47.8	47.1	46.0	45.0	44.9	47.0	50.0
13	47.4	47.6	47.5	47.0	47.4	46.6	46.5	45.6	44.5	45.5	48.3	50.5
14	47.5	47.5	47.5	47.1	46.5	46.5	43.6	44.4	49.5	48.5	50.0	50.5
15	48.1	48.2	48.5	47.6	48.3	47.0	45.7	46.2	43.6	47.5	47.5	50.7
16	48.3	47.6	47.6	47.5	45.6	49.4	46.0	44.6	45.4	46.4	49.0	51.5
17	49.0	48.0	48.2	49.7	49.3	46.1	46.0	48.1	50.5	55.0	52.9	51.0
18	47.9	48.4	49.4	48.4	47.9	47.6	46.5	45.9	45.2	46.6	49.3	50.9
19	48.9	48.2	49.3	48.6	48.2	47.8	47.0	45.5	44.6	44.3	46.4	49.3
20	42.5	32.5	41.4	58.8	57.7	58.4	46.0	45.2	45.6	49.3	51.5	53.0
21	52.5	48.5	46.7	54.3	50.6	49.3	48.0	55.7	51.0	50.8	49.0	51.3
22	51.7	50.6	46.0	47.5	47.5	49.5	46.6	46.5	45.3	44.5	47.6	50.4
23	48.4	49.3	49.0	48.9	49.4	49.4	48.3	46.7	46.6	46.4	48.2	50.3
24	48.3	48.5	50.5	49.6	50.0	48.8	47.5	46.0	46.7	47.4	48.6	50.7
25	49.3	48.5	47.9	49.3	49.6	49.1	47.4	46.3	46.7	46.8	48.5	50.5
26	48.0	50.3	49.5	47.8	48.7	52.6	50.0	47.2	46.6	45.7	48.5	50.0
27	48.2	48.7	48.7	49.1	47.5	48.0	47.7	47.3	47.8	48.6	50.4	50.1
28	47.9	48.0	47.5	48.1	50.7	47.1	47.4	47.0	47.0	46.1	48.8	50.4
29	48.1	49.0	48.4	49.9	48.3	48.3	46.9	46.9	46.4	46.6	48.6	50.5
30	48.3	49.2	48.3	48.2	49.9	48.3	46.7	46.5	46.6	46.2	48.5	49.6
Mean	48.21	47.87	48.08	48.85	48.44	48.28	46.64	46.04	45.95	46.69	48.54	50.69

Declination for the Month, 1891 November

for any hour added to the base-line value gives the absolute westerly declination at that hour

 $= 3^{\circ} 23' 06''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Nov.													
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	53.6	53.9	53.1	51.6	49.9	49.4	48.8	48.5	48.4	47.8	48.1	47.9	50.08
4	56.8	56.0	54.0	51.8	50.5	48.9	48.7	48.1	48.0	48.4	47.3	47.1	49.30
5	53.0	53.0	53.0	52.0	52.0	51.3	49.1	47.2	47.5	48.0	48.0	48.0	48.44
6	52.3	52.2	51.4	50.1	49.3	49.4	49.2	49.0	48.2	47.0	44.2	45.2	48.20
7	52.4	52.8	51.3	49.8	49.2	49.0	48.2	48.0	48.0	47.8	48.0	48.0	48.07
8	52.3	52.8	52.3	51.2	49.6	49.3	49.0	48.2	48.0	47.9	48.0	48.1	48.19
9	51.5	52.0	51.3	50.6	49.7	48.9	48.5	48.1	47.7	47.5	47.4	47.7	48.14
10	53.2	53.6	54.4	53.5	50.2	49.3	49.4	49.5	48.6	47.4	48.0	48.0	48.75
11	51.5	51.9	51.3	50.6	49.2	49.2	48.5	48.4	48.9	47.5	48.0	48.1	48.33
12	51.5	51.9	51.4	50.3	49.7	49.6	50.0	50.5	47.5	47.5	47.4	47.5	48.57
13	51.6	51.5	50.3	49.1	49.5	50.6	49.4	49.5	47.5	48.0	47.1	47.6	48.17
14	52.4	54.0	54.3	52.4	50.4	48.6	47.5	49.7	35.0	45.2	47.9	46.1	48.03
15	53.2	51.7	50.6	49.8	49.7	49.2	47.5	47.4	47.9	43.7	48.0	49.3	48.20
16	53.5	56.4	52.4	51.1	47.2	50.9	48.2	48.1	38.8	48.0	48.0	48.7	48.76
17	52.2	52.1	51.7	49.9	48.6	48.5	48.9	48.2	48.1	48.2	47.0	49.0	49.43
18	52.0	52.1	50.9	49.9	49.1	48.5	48.1	48.0	48.0	48.1	48.3	48.9	48.58
19	52.3	52.3	51.2	50.4	49.0	47.6	46.8	48.0	46.9	43.4	47.2	46.4	47.90
20	55.4	58.0	57.0	52.2	49.4	48.6	44.8	47.4	46.1	48.2	48.6	49.5	49.46
21	52.5	56.5	53.6	52.9	49.2	48.2	47.2	44.5	46.3	48.0	48.2	47.3	50.09
22	53.4	53.1	52.0	50.5	49.0	48.8	48.8	48.8	47.8	44.2	46.5	47.3	48.50
23	51.5	52.3	51.9	50.6	49.3	49.1	48.5	48.2	48.3	48.0	46.6	47.7	48.87
24	51.9	52.5	52.0	50.5	49.5	48.6	48.3	47.5	47.9	48.0	47.5	47.6	48.93
25	51.8	52.5	51.9	51.7	49.9	49.6	47.1	46.8	45.9	47.2	44.0	43.3	48.40
26	51.8	53.3	52.3	51.7	50.9	50.0	48.3	47.1	47.5	47.2	48.1	46.4	48.73
27	51.0	52.1	51.5	51.7	49.8	48.5	48.8	48.6	46.3	47.9	47.1	47.9	48.89
28	50.5	51.1	49.9	50.4	49.8	48.5	48.3	48.1	47.1	48.0	48.6	48.2	48.52
29	52.0	51.8	51.6	50.8	49.8	49.3	48.7	48.6	47.8	48.0	48.5	49.2	48.92
30	50.2	50.5	50.3	50.0	49.6	48.9	48.0	48.6	48.1	48.3	48.1	49.0	48.58
Mean	52.40	53.00	52.10	50.97	49.61	49.23	48.31	48.16	46.86	47.30	47.49	47.68	48.64

TABLE 5—Continued—*Hourly Values of the*

Ordinates, expressed in minutes of arc, taken from the daily declination traces. The ordinate

Base-line value

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Dec.	/	/	/	/	/	/	/	/	/	/	/	/
1	49.1	49.0	50.3	48.9	48.0	47.8	47.0	46.0	45.8	47.2	49.8	52.7
2	49.4	49.0	49.5	47.4	47.4	47.1	46.5	45.3	46.0	46.9	48.5	50.4
3	48.6	49.0	48.5	48.0	48.0	47.8	47.5	46.8	46.5	47.0	48.5	50.5
4	48.4	48.5	48.3	48.4	46.6	46.7	45.3	44.1	45.1	46.5	48.5	51.8
5	48.6	48.6	48.5	47.9	47.8	48.5	47.5	46.8	45.6	45.3	47.8	51.0
6	48.3	48.6	48.5	47.7	48.3	47.7	47.0	46.3	45.0	45.2	47.8	51.0
7	45.6	44.1	44.5	43.3	45.7	49.5	52.5	48.7	50.4	55.3	59.1	56.0
8	49.5	49.0	48.8	48.5	48.8	47.5	48.0	46.8	45.6	46.0	47.3	49.3
9	48.7	48.7	48.7	48.6	49.4	48.3	47.5	52.5	47.4	46.5	47.7	50.7
10	46.5	48.6	47.9	49.6	48.9	48.2	48.6	47.5	46.6	45.5	46.6	50.7
11	48.6	48.5	48.3	52.5	50.2	48.0	48.0	49.0	49.5	47.8	47.5	50.5
12	48.3	49.4	49.0	48.6	48.0	48.0	47.6	47.1	46.1	47.5	47.7	50.5
13	49.5	49.4	49.5	47.7	51.4	46.9	47.4	46.8	46.6	47.0	47.7	49.8
14	48.6	46.4	48.5	48.3	48.3	48.7	48.0	47.4	46.4	46.6	47.5	49.6
15	48.9	49.1	48.8	48.5	47.8	48.8	48.2	47.2	47.0	47.3	48.0	50.0
16	50.3	48.2	48.9	48.5	48.3	47.5	47.8	46.8	45.9	46.8	47.8	49.7
17	49.1	49.0	48.9	48.8	48.5	48.6	47.8	47.3	47.0	47.8	49.2	51.1
18	48.9	49.1	48.8	48.8	47.8	47.9	47.0	46.7	45.7	46.1	48.0	51.6
19	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
20	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
21	42.2	44.5	50.6	51.0	54.0	49.8	47.8	45.0	47.7	46.0	49.1	52.0
22	48.3	47.0	52.0	57.5	50.0	49.1	53.6	55.7	49.2	45.1	49.5	52.6
23	48.2	50.6	49.4	49.1	49.6	49.6	51.1	49.2	43.8	44.3	46.4	49.4
24	48.9	49.2	49.0	48.9	48.6	48.5	48.2	47.1	44.3	44.7	47.3	51.0
25	50.0	50.0	51.3	49.2	48.0	48.9	48.1	46.8	44.9	43.3	47.0	49.9
26	48.3	49.0	48.9	48.5	48.0	48.3	47.9	46.8	44.5	43.8	48.2	49.8
27	48.1	49.0	49.5	50.0	48.3	48.0	47.1	46.2	44.5	44.2	46.8	49.0
28	49.0	48.2	48.2	49.0	49.0	48.0	47.2	46.0	46.8	45.8	48.0	51.0
29	48.7	49.2	49.1	48.8	48.3	46.9	47.8	46.0	45.1	45.3	50.1	52.2
30	52.6	46.0	45.4	45.6	46.6	45.5	43.5	45.4	50.7	48.1	51.3	52.7
31	48.8	49.0	48.6	48.2	48.0	48.0	47.4	46.3	45.9	47.5	49.2	51.2
Mean	48.55	48.41	48.83	48.82	48.54	48.07	47.89	47.23	46.40	46.43	48.55	50.96

Declination for the Month, 1891 December

for any hour added to the base-line value gives the absolutely westerly declination at that hour

 $= 3^{\circ} 23' 28''$

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Dec.	/	/	/	/	/	/	/	/	/	/	/	/	/
1	53.6	53.3	52.1	50.6	49.5	49.1	48.5	48.0	47.6	48.1	48.2	48.4	49.11
2	52.1	51.2	50.9	49.7	50.3	49.3	48.6	48.4	47.7	48.4	48.4	48.5	48.62
3	51.6	52.0	50.9	49.4	48.9	48.6	48.1	47.8	47.5	47.6	47.6	48.0	48.53
4	54.2	52.6	51.5	50.5	49.3	48.4	47.8	47.3	47.4	47.6	48.2	48.3	48.39
5	54.0	54.3	52.9	50.1	49.8	48.8	47.9	47.3	47.3	47.6	47.8	48.5	48.76
6	52.2	52.4	51.3	50.6	50.1	50.0	50.1	50.0	50.3	44.8	44.5	43.9	48.40
7	51.0	57.5	52.7	50.6	50.0	49.1	46.6	44.5	44.5	47.3	47.5	47.4	49.31
8	51.6	51.4	50.5	49.5	49.4	48.6	47.8	47.6	48.0	48.0	48.4	48.6	48.52
9	54.8	53.6	55.8	54.8	52.5	54.4	51.5	48.0	47.0	46.2	42.7	43.9	49.58
10	51.6	52.6	52.5	51.0	49.4	49.4	48.3	49.6	47.0	45.8	46.4	48.5	48.64
11	52.2	53.3	52.1	52.1	49.5	50.4	48.2	45.3	48.2	47.4	47.0	47.8	49.25
12	53.2	50.9	51.5	50.8	50.2	49.4	48.6	48.2	47.8	45.7	47.7	48.0	48.74
13	50.5	50.6	52.2	50.8	51.4	49.4	48.9	48.4	47.8	47.8	47.7	47.6	48.87
14	53.1	53.4	51.6	51.1	52.0	50.6	48.0	48.8	47.7	47.9	48.3	48.6	48.98
15	51.2	51.0	51.0	50.2	49.1	48.5	48.0	47.1	48.0	48.4	48.2	48.8	48.71
16	51.7	52.1	51.0	50.2	49.0	48.7	48.2	48.2	47.9	48.1	48.1	48.6	48.68
17	52.2	52.0	51.1	50.4	49.3	48.6	47.8	47.3	47.1	47.7	47.7	48.5	48.87
18	.	.	.	.	.	.	.	.	.	.	.	.	48.34
19	.	.	.	.	.	.	.	.	.	.	.	.	
20	51.0	51.9	52.0	50.3	49.0	49.2	47.8	46.7	46.6	45.6	47.1	46.5	
21	52.9	53.0	52.6	51.7	50.0	48.4	48.6	42.5	47.5	42.1	48.3	46.3	48.48
22	53.9	52.0	51.0	51.1	50.1	48.5	46.8	47.7	45.6	45.5	47.6	48.0	49.89
23	52.0	53.2	52.8	50.7	49.3	48.8	48.3	48.0	47.8	48.2	47.7	48.3	48.99
24	53.2	52.6	51.8	50.4	49.6	48.9	48.1	47.9	48.0	47.0	48.0	48.2	48.73
25	50.9	51.0	51.0	50.5	49.2	48.8	48.2	48.3	48.1	48.4	48.5	48.0	48.68
26	50.7	50.5	50.1	50.0	49.0	48.5	47.9	47.6	46.9	48.0	48.0	47.8	48.21
27	50.5	50.6	50.2	49.6	48.6	48.4	48.2	48.1	47.3	48.2	48.5	48.8	48.24
28	51.2	50.5	49.5	49.4	48.4	48.9	48.7	48.5	48.3	48.3	48.6	49.1	48.57
29	52.2	51.0	50.4	49.3	48.5	48.5	48.1	48.1	48.0	43.0	47.3	45.6	48.23
30	55.1	53.5	50.2	48.6	48.3	48.4	48.6	48.3	47.5	47.7	48.6	48.9	48.63
31	51.6	50.8	49.5	49.8	49.3	48.9	48.6	47.5	47.8	48.5	48.7	48.6	48.65
Mean	52.28	52.23	51.47	50.48	49.62	49.16	48.30	47.62	47.52	47.07	47.63	47.79	48.74

TABLE 6—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
January												
1	657	672	732	712	712	727	722	747	747	657	..	..
2	514	505	536	556	565	592	576	606	588	476	373	274
3	462	471	493	521	508	548	548	536	477	311	231	267
4	531	545	562	581	581	594	599	631	578	434	317	291
5	541	563	586	604	609	677	693	669	645	625	386	364
6	514	555	538	574	638	597	579	516	526	373	381	382
7	524	543	564	579	588	603	611	607	558	431	276	285
8	558	570	585	585	594	604	613	636	627	505	286	304
9	571	603	616	617	631	621	626	654	646	565	447	352
10	434	496	546	555	619	646	632	696	718	597	422	297
11	519	537	524	541	556	565	610	601	623	511	376	337
12	529	524	570	619	615	661	710	746	612	576	503	319
13	535	544	544	577	590	598	598	618	595	460	289	253
14	500	508	581	509	546	622	662	604	619	469	272	249
15	537	563	563	597	614	646	646	647	565	399	287	323
16	561	628	647	580	705	684	670	671	685	500	135	—069
17	363	341	328	463	428	440	454	510	491	334	240	190
18	419	445	445	455	483	501	510	496	457	255	353	317
19	451	402	406	443	524	533	448	426	462	246	232	192
20	309	416	366	475	494	480	539	547	503	450	274	193
21	458	450	557	532	541	541	522	533	521	419	312	208
22	436	459	467	478	525	509	513	524	488	348	154	192
23	507	493	479	494	525	520	593	575	516	435	360	310
24	467	502	552	574	628	548	503	611	615	598	401	270
25	503	512	521	535	563	558	580	541	478	401	340	303
26	530	544	567	584	598	590	568	563	500	446	330	262
27	584	584	594	607	634	634	640	618	540	446	262	36
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..
30	544	548	556	581	598	671	621	653	617	451	266	..
31	516	526	536	572	572	586	586	613	559	591	208	149
Mean	501	519	537	555	579	590	592	600	571	459	311	261

Force for the Month, 1891 January

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
January													
1	363	394	488	530	548	557	554	514	508	504	473	496	591
2	265	351	437	523	519	509	488	488	484	484	471	462	485
3	339	420	488	560	542	538	521	526	502	494	494	512	471
4	322	385	484	560	580	571	552	531	531	508	527	522	513
5	511	539	651	684	612	517	532	554	568	554	523	510	572
6	410	477	522	596	582	568	555	551	551	537	529	524	524
7	375	442	555	623	596	582	564	569	569	565	569	558	531
8	385	479	574	683	705	669	656	629	611	602	588	575	568
9	372	419	533	598	620	616	620	662	617	535	486	429	561
10	378	423	482	544	518	564	590	564	545	514	528	496	533
11	368	477	526	577	522	527	577	544	586	573	545	542	528
12	365	459	487	582	591	550	546	542	539	543	539	540	553
13	295	385	493	588	600	596	611	597	580	535	584	535	525
14	309	404	413	548	495	481	459	463	472	496	500	514	487
15	423	486	580	644	648	657	645	612	596	546	456	503	549
16	433	437	577	572	420	496	430	461	426	336	322	255	482
17	036	366	470	507	466	173	426	453	454	472	454	445	388
18	287	301	305	313	297	347	248	066	356	393	374	389	367
19	197	188	265	363	446	397	433	423	406	460	365	371	378
20	253	307	388	487	497	515	505	529	539	461	416	495	435
21	340	434	529	560	534	556	521	319	449	421	454	450	465
22	286	368	417	463	490	535	505	541	537	537	506	524	450
23	329	459	576	626	680	667	609	568	547	537	618	565	525
24	405	446	429	478	478	478	470	479	475	483	479	484	494
25	402	461	532	569	557	516	484	466	516	525	589	534	499
26	384	483	561	615	610	587	579	562	557	557	553	589	530
27	..	..	..	..	..	..	..	..	..	..	..	..	532
28	..	..	..	..	..	..	..	..	..	..	..	..	
29	..	338	442	559	632	640	551	555	543	515	560	511	
30	..	..	551	592	587	573	548	525	511	503	503	508	548
31	182	286	429	533	583	593	579	579	575	557	549	540	500
Mean	334	408	489	554	551	537	530	513	522	508	502	496	501

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
February												
1	567	559	581	632	628	605	618	596	560	502	340	156
2	519	505	519	528	538	542	561	569	570	467	386	291
3	484	521	533	570	584	579	579	603	539	468	365	279
4	583	593	602	616	628	639	634	629	625	613	532	464
5	633	656	670	674	689	689	671	672	623	510	357	353
6	492	496	545	532	542	573	583	587	573	506	421	399
7	374	452	487	505	515	524	524	515	485	443	413	404
8	524	559	542	573	610	610	619	601	629	616	598	521
9	624	629	665	710	711	742	751	517	526	662	446	631
10	350	386	423	418	464	486	504	469	388	425	375	302
11	509	464	519	509	519	560	560	560	577	556	538	443
12	209	460	280	344	424	515	542	565	295	301	211	282
13	434	434	524	520	399	448	475	475	457	382	242	206
14	403	394	444	506	575	431	498	457	363	157	053	053
15	—137	228	111	534	301	495	413	499	347	346	369	351
16	540	545	562	549	477	558	523	558	645	663	649	600
17	455	472	550	517	517	558	576	416	653	717	721	636
18	493	495	495	495	536	527	542	483	492	528	488	433
19	437	474	482	505	541	560	617	502	403	457	448	448
20	510	520	542	546	533	583	592	547	485	404	332	332
21	530	521	521	552	553	549	567	522	437	415	397	446
22	557	557	566	598	612	608	608	513	424	339	312	325
23	410	559	383	545	546	560	595	510	448	363	354	363
24	599	599	595	604	623	596	583	502	367	274	152	180
25	592	637	609	596	664	624	714	669	493	583	471	454
26	408	673	691	704	709	710	674	655	602	521	256	229
27	508	548	558	589	593	594	590	585	545	527	510	515
28	616	612	603	612	580	626	631	621	550	524	430	420
Mean	472	520	522	539	557	575	584	550	504	474	399	376

Force for the Month, 1891 February

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
February													
1	088	268	390	454	530	509	495	446	459	459	481	531	476
2	333	383	463	554	586	572	559	560	560	542	537	515	506
3	298	378	474	555	604	595	586	574	565	574	551	578	518
4	487	514	541	569	614	627	641	637	628	624	620	620	595
5	421	470	565	636	674	678	620	421	382	405	495	492	561
6	421	539	507	485	386	462	440	387	496	428	441	418	486
7	454	431	387	481	549	553	545	491	550	603	550	532	490
8	527	527	500	491	528	582	577	568	578	583	579	579	567
9	442	302	286	393	470	493	119	078	017	026	418	373	453
10	212	201	205	156	197	543	543	517	540	522	497	473	400
11	435	386	067	252	252	387	512	504	437	306	158	243	427
12	219	069	063	122	216	261	378	383	473	311	338	401	314
13	093	197	127	279	184	307	324	483	406	334	371	366	353
14	049	081	104	230	262	234	226	263	110	285	133	037	265
15	317	402	487	546	470	502	551	524	544	511	499	539	406
16	597	565	552	507	556	544	454	526	539	539	539	598	558
17	551	272	317	524	529	489	480	408	219	450	495	490	501
18	282	309	363	373	354	484	490	390	480	486	424	432	453
19	443	493	503	503	481	490	473	500	460	439	460	536	486
20	433	518	540	572	564	536	569	510	537	551	560	534	516
21	505	618	690	699	668	600	519	565	610	601	565	565	551
22	425	520	632	664	615	629	674	665	612	567	427	436	537
23	408	466	521	585	571	597	597	621	631	598	567	563	517
24	324	414	553	635	594	518	482	451	513	558	568	608	496
25	512	521	554	599	558	607	626	672	658	681	686	681	603
26	481	509	572	518	473	541	438	483	556	601	538	502	543
27	505	523	583	606	623	592	619	633	619	602	579	615	573
28	487	560	628	556	538	592	601	593	607	638	638	638	579
Mean	380	404	435	484	487	519	505	488	492	494	490	496	489

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
March												
1	621	625	611	630	639	640	649	618	581	509	461	412
2	784	819	815	865	997	861	996	861	714	719	710	732
3	403	430	745	677	439	417	341	651	660	705	548	270
4	596	584	511	520	521	540	540	536	513	414	275	189
5	495	522	594	590	770	644	644	667	631	595	649	682
6	509	513	486	468	599	601	577	523	483	501	493	421
7	563	510	563	563	528	601	564	452	457	237	434	502
8	573	614	623	659	651	652	652	629	570	525	473	473
9	623	656	628	660	652	647	634	534	455	405	392	405
10	576	603	603	629	639	630	599	545	500	410	380	380
11	639	622	644	639	657	689	685	631	519	393	385	434
12	667	694	694	707	685	632	695	583	363	376	502	471
13	470	430	358	434	425	476	409	458	444	336	230	180
14	615	642	628	583	602	539	606	598	517	460	446	460
15	639	675	589	693	630	577	577	671	712	707	692	776
16	554	694	571	424	549	541	515	537	231	312	520	340
17	559	576	626	586	663	479	614	659	538	398	386	498
18	367	529	515	537	582	503	530	341	395	403	373	351
19	552	628	597	624	629	656	553	512	509	423	270	369
20	702	562	562	603	598	617	577	455	347	343	348	425
21	680	671	684	684	702	689	672	613	559	577	619	690
22	644	738	707	689	753	762	749	654	597	507	462	507
23	749	839	726	812	785	790	705	782	588	471	391	441
24	799	502	547	659	764	719	643	558	450	549	464	338
25	585	643	648	473	661	527	649	572	437	374	362	393
26	973	698	608	635	779	766	681	573	581	550	497	461
27	667	698	739	743	713	744	659	627	565	407	435	516
28	646	718	686	681	686	727	637	543	422	322	333	409
29	691	700	723	723	724	732	701	634	508	410	369	414
30	725	770	765	751	778	797	792	644	563	491	502	677
31	297	527	410	432	591	604	591	591	421	407	704	650
Mean	615	627	620	625	658	639	627	589	511	459	455	460

Force for the Month, 1891 March

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
March													
1	470	533	574	593	606	620	647	683	868	860	733	769	624
2	—293	—217	233	310	324	302	311	405	429	492	533	474	549
3	067	315	382	357	289	369	383	234	366	321	313	403	420
4	307	388	388	388	416	394	389	240	417	503	516	499	441
5	344	142	344	380	210	278	331	340	426	485	490	634	495
6	443	457	533	539	503	565	570	570	554	571	562	639	528
7	593	620	620	570	481	563	536	515	480	582	605	600	531
8	535	616	616	644	617	631	635	654	636	627	622	659	605
9	491	581	690	766	457	547	547	497	458	526	602	561	559
10	389	551	564	556	646	646	660	620	656	652	643	661	572
11	389	534	624	660	633	651	642	660	671	671	666	697	602
12	476	499	611	656	477	594	—077	063	303	343	424	424	494
13	193	342	436	487	568	536	541	572	542	578	587	600	443
14	546	559	762	712	619	421	479	367	309	435	418	647	540
15	816	556	263	529	678	664	628	557	580	634	494	638	624
16	506	556	524	327	484	394	341	529	540	769	540	526	493
17	539	562	764	624	441	405	284	495	415	771	375	541	533
18	319	409	607	603	675	671	613	622	641	582	555	582	513
19	447	478	604	469	456	466	421	470	570	566	570	611	519
20	515	591	623	624	646	637	651	674	751	630	656	634	574
21	718	735	731	769	755	719	701	728	715	706	666	688	686
22	616	651	661	751	792	792	783	742	739	743	748	731	688
23	531	270	360	766	788	563	401	622	627	483	483	726	612
24	425	478	572	366	389	565	516	623	633	647	633	570	559
25	497	560	627	705	713	673	651	656	669	706	697	669	589
26	560	691	722	683	732	462	678	723	662	666	671	688	656
27	611	670	746	661	747	707	464	702	685	685	645	713	648
28	454	553	652	717	821	712	712	703	718	704	718	718	625
29	519	672	748	789	768	745	749	749	769	769	741	746	671
30	627	632	618	669	583	408	363	133	134	400	324	414	565
31	678	543	381	692	419	261	161	333	406	465	482	600	485
Mean	462	501	567	592	572	547	507	532	560	599	571	615	563

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added
 $.198000 +$

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
April												
1	579	385	385	241	520	453	421	336	385	345	210	183
2	296	462	350	530	566	530	345	431	390	296	300	246
3	525	475	444	610	570	511	565	498	363	290	273	264
4	633	588	543	633	610	579	543	453	385	273	219	224
5	493	516	552	557	588	569	543	467	444	358	264	250
6	566	588	615	607	619	619	584	503	354	282	273	404
7	678	772	668	673	656	566	758	633	431	277	178	116
8	377	444	507	706	436	444	287	391	102	—650	—375	—231
9	448	376	440	340	493	452	362	272	336	—016	—258	—223
10	471	521	674	566	543	494	457	462	575	570	—024	142
11	543	561	606	584	592	570	543	520	421	345	201	304
12	561	552	548	701	651	426	660	714	449	251	026	120
13	390	345	385	425	318	413	363	403	155	110	200	084
14	475	453	498	539	503	449	413	503	413	377	273	403
15	561	569	583	569	569	516	479	444	358	264	214	174
16	574	570	574	557	566	534	529	458	435	458	521	539
17	637	570	574	556	691	556	570	201	246	—205	—480	—165
18	530	481	448	620	552	597	471	273	079	588	616	526
19	542	547	547	525	561	566	561	440	300	241	313	385
20	719	696	719	719	768	831	727	592	656	332	431	525
21	664	610	633	619	570	633	619	489	349	304	529	584
22	593	615	683	611	620	606	638	525	300	251	466	584
23	628	610	646	633	664	673	605	421	385	403	511	538
24	651	638	660	669	647	629	589	516	332	242	336	539
25	692	687	718	704	655	637	574	512	448	354	471	534
26	633	629	633	633	638	674	660	480	327	269	332	449
27	758	713	723	750	727	741	768	651	488	372	381	408
28	741	728	723	723	710	728	728	661	593	598	642	696
29	642	700	610	665	606	624	632	579	511	462	421	475
30	665	674	696	692	678	670	656	543	431	381	530	687
Mean	576	569	580	599	596	576	555	479	381	281	266	326

TABULAR RESULTS

F.57

Force for the Month, 1891 April

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
April													
1	267	374	523	478	442	402	317	419	424	632	307	339	390
2	347	298	419	487	599	491	266	563	509	509	478	527	426
3	442	582	604	541	555	608	577	551	551	582	618	586	508
4	342	455	586	653	473	586	555	555	545	982	563	608	524
5	163	222	550	550	550	586	586	582	582	640	582	572	491
6	541	550	613	635	599	604	604	635	644	613	595	654	550
7	—017	384	429	546	618	442	577	622	626	514	892	285	464
8	—049	180	536	455	410	311	284	329	469	491	379	370	275
9	055	303	370	460	469	519	519	545	519	410	316	357	319
10	324	428	369	419	509	514	537	559	559	496	582	527	470
11	467	303	542	807	452	424	244	366	415	469	514	694	479
12	212	352	172	428	158	487	—148	415	388	298	388	464	386
13	298	406	523	532	461	541	559	559	582	478	420	546	396
14	432	518	577	595	640	600	550	460	455	401	541	514	474
15	271	249	470	510	519	523	568	555	568	527	537	564	465
16	514	523	599	559	356	388	429	581	609	419	509	554	515
17	—062	051	356	389	474	276	258	280	311	415	442	591	314
18	401	478	545	469	540	523	505	495	487	495	483	509	488
19	465	551	595	640	623	613	600	635	623	623	627	717	535
20	563	459	617	743	667	667	537	594	554	689	608	554	624
21	627	667	722	847	837	411	636	694	613	644	708	568	607
22	581	703	743	743	622	482	631	581	648	622	707	648	592
23	613	663	690	717	532	658	658	604	649	663	658	653	603
24	649	487	775	690	702	690	662	649	640	635	645	649	597
25	591	622	699	717	676	631	605	627	627	627	627	631	611
26	536	644	716	725	640	666	676	694	703	694	685	707	602
27	510	618	685	704	749	708	671	667	690	694	676	721	649
28	644	663	725	743	753	739	743	788	775	424	514	620	683
29	568	690	735	766	762	717	640	649	663	672	609	725	630
30	770	819	874	807	698	739	721	680	644	617	631	644	664
Mean	402	475	579	612	570	552	519	564	569	566	561	570	513

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
May												
1	664	664	664	660	633	646	606	547	461	471	556	660
2	669	696	696	696	696	724	679	480	341	386	516	624
3	638	534	669	633	628	628	597	380	403	462	687	763
4	557	543	610	647	655	647	655	629	602	399	647	778
5	543	561	565	602	647	687	633	462	479	394	462	592
6	832	737	732	728	709	647	728	633	359	287	723	629
7	628	633	623	597	601	592	578	466	353	367	633	682
8	507	507	583	538	530	606	507	358	386	597	687	710
9	457	579	575	597	542	632	601	525	440	372	331	452
10	512	602	462	462	552	570	552	422	507	372	494	597
11	461	529	615	525	615	660	646	584	547	457	336	606
12	597	687	656	665	670	656	566	638	476	544	651	736
13	660	687	700	777	773	773	638	736	520	548	565	687
14	139	318	516	548	498	633	260	418	278	115	051	093
15	223	471	624	377	088	484	-736	-1296	-969	-1014	-497	-331
16	444	431	557	602	061	152	427	337	-109	134	070	386
17	304	349	349	300	341	345	390	372	372	327	246	277
18	417	377	458	417	413	471	448	260	125	156	260	327
19	530	552	565	597	592	502	507	372	462	241	336	534
20	530	570	584	584	530	561	580	485	322	395	566	687
21	547	619	570	520	570	574	475	475	426	394	286	281
22	575	579	589	575	575	624	548	395	264	296	507	597
23	515	548	552	556	597	560	475	340	192	290	430	615
24	678	615	655	629	651	598	638	570	377	340	489	534
25	651	647	619	642	687	696	659	498	295	214	354	538
26	652	652	656	660	687	764	764	584	534	489	337	714
27	668	606	709	709	754	754	750	651	556	601	601	736
28	678	813	777	813	917	773	706	628	507	467	467	575
29	587	646	741	786	902	988	890	620	376	511	457	826
30	629	633	625	715	588	678	620	440	300	300	440	575
31	696	624	624	646	660	714	674	551	461	326	461	596
Mean	554	581	610	607	593	624	550	437	343	330	434	551

TABULAR RESULTS

F.59

Force for the Month, 1891 May

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
May													
1	613	699	677	568	734	757	685	573	677	667	667	654	634
2	703	788	833	608	698	653	693	644	667	738	707	681	651
3	856	851	784	608	483	532	622	649	658	649	613	613	622
4	780	784	806	919	379	235	532	154	311	424	469	649	575
5	726	861	901	834	721	717	757	748	766	793	740	765	665
6	586	509	541	531	509	626	599	586	541	586	586	621	607
7	626	730	730	595	685	460	446	401	406	397	460	631	555
8	739	833	649	725	698	581	604	626	635	843	550	410	600
9	613	703	758	618	578	635	668	672	649	586	483	447	563
10	689	658	639	653	582	604	568	428	514	586	604	537	549
11	730	726	722	694	644	618	649	599	622	627	618	618	602
12	869	779	892	783	752	653	738	738	689	653	644	667	683
13	771	843	780	776	236	487	487	641	546	541	271	406	619
14	640	797	820	460	923	465	527	280	—1025	—130	401	406	351
15	294	245	235	366	294	347	352	532	474	392	366	560	078
16	253	298	523	486	388	253	298	388	365	451	351	347	329
17	411	406	316	375	442	339	429	474	334	375	375	415	361
18	464	649	595	671	626	536	495	478	505	577	581	608	455
19	775	694	753	753	578	398	578	573	528	888	478	483	553
20	599	694	739	824	698	658	568	554	599	554	478	604	582
21	523	509	554	739	546	708	582	559	573	559	573	546	530
22	644	716	608	599	603	608	487	572	568	523	644	563	552
23	672	568	643	622	721	676	663	653	627	649	690	645	562
24	721	743	739	743	747	653	612	608	617	612	631	608	617
25	775	892	924	797	703	645	645	622	650	650	650	650	629
26	716	761	811	901	896	789	662	654	644	640	631	509	671
27	856	919	1009	870	892	955	996	906	929	991	856	721	791
28	608	563	540	424	554	730	730	225	235	325	428	550	585
29	928	969	793	807	609	725	541	586	578	690	578	568	696
30	762	694	829	815	627	559	473	527	492	631	653	717	597
31	693	770	833	806	747	738	558	631	648	657	648	648	642
Mean	666	698	709	676	622	592	590	557	517	585	562	576	565

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
June												
1	637	668	637	645	650	650	610	578	574	673	780	835
2	673	678	740	736	745	740	745	695	695	574	691	768
3	597	587	601	637	650	605	479	372	434	560	673	709
4	794	794	704	610	513	741	610	493	291	332	403	462
5	606	691	831	826	767	610	606	551	533	578	704	798
6	574	642	660	543	588	611	570	471	394	412	393	479
7	677	641	637	655	677	677	655	601	601	560	601	682
8	628	669	624	575	624	655	660	561	570	462	385	565
9	759	736	726	681	655	681	641	681	601	556	542	551
10	660	637	651	646	660	696	714	664	588	502	502	516
11	709	690	713	718	686	723	682	583	538	583	628	583
12	660	660	660	664	705	728	723	673	543	425	458	507
13	732	722	732	732	740	763	699	619	470	515	650	718
14	704	768	687	704	732	768	772	727	749	749	768	740
15	610	610	655	966	921	786	839	043	006	637	722	745
16	552	583	574	570	597	606	651	687	696	701	484	403
17	615	660	677	677	705	705	709	637	488	425	542	578
18	700	628	628	628	673	700	552	452	480	457	520	705
19	704	861	650	632	664	709	650	587	466	254	403	534
20	529	691	624	430	574	574	579	511	354	354	359	439
21	673	596	574	573	619	619	605	457	349	142	214	520
22	624	579	619	642	610	624	565	507	408	268	323	484
23	699	632	718	682	767	754	646	569	484	425	488	538
24	592	498	588	592	678	633	588	524	367	457	524	457
25	651	663	623	565	511	632	596	506	493	426	430	502
26	601	525	507	493	547	480	566	583	426	529	628	817
27	672	492	537	542	547	497	520	470	511	335	290	610
28	587	624	597	642	651	660	637	565	502	444	412	538
29	587	583	583	650	691	695	628	538	501	470	534	601
30	606	615	592	601	629	682	641	534	449	371	455	484
Mean	647	647	645	642	659	667	638	548	485	473	516	596

TABULAR RESULTS

F.61

Force for the Month, 1891 June

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
June													
1	896	896	901	693	730	707	730	743	716	743	752	667	713
2	869	837	787	770	572	558	720	617	562	554	635	725	695
3	661	725	747	730	761	721	676	545	567	617	702	612	624
4	536	599	689	779	720	657	599	653	661	644	608	599	604
5	851	883	977	1153	834	761	689	595	815	631	879	486	736
6	621	576	666	793	738	707	662	630	689	648	608	644	597
7	824	810	910	820	775	685	630	563	635	590	618	775	679
8	657	769	869	828	779	837	724	743	788	814	847	675	680
9	. .	652	838	793	779	725	676	680	680	684	672	658	680
10	684	684	688	684	729	711	702	716	716	716	721	711	662
11	726	865	959	982	788	721	703	667	658	671	667	667	705
12	666	824	918	918	828	765	756	716	697	693	697	701	691
13	743	856	685	645	735	690	694	730	752	752	752	735	703
14	747	725	680	819	571	734	630	590	545	522	649	590	695
15	. .	775	775	752	752	716	595	568	595	559	550	572	650
16	495	630	720	594	580	504	527	527	531	653	639	666	590
17	585	757	815	833	779	739	671	554	581	626	626	644	651
18	882	837	734	855	724	639	716	716	693	581	743	657	663
19	684	824	892	856	689	707	582	532	680	662	554	563	639
20	451	811	968	856	702	662	563	572	572	693	626	590	587
21	761	991	1041	1022	775	712	536	608	626	626	648	586	620
22	648	797	761	720	621	581	607	595	617	630	648	662	589
23	766	887	887	775	847	680	645	550	545	465	510	536	646
24	594	739	779	819	770	630	612	644	599	639	630	661	609
25	523	707	784	797	707	550	644	572	613	644	644	644	601
26	774	715	760	707	558	535	531	568	523	608	523	535	585
27	680	653	649	720	604	487	536	585	640	613	599	595	558
28	675	752	783	738	684	630	585	589	657	626	608	630	617
29	766	860	892	883	766	672	622	604	667	631	613	658	654
30	581	603	612	631	680	631	635	635	671	648	733	693	599
Mean	693	768	806	792	719	668	640	620	643	639	657	638	644

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
July												
1	693	730	654	650	656	702	702	613	551	412	520	566
2	504	501	506	480	525	572	536	551	362	295	308	440
3	612	599	555	556	512	593	545	551	339	060	111	301
4	126	171	146	421	399	467	464	397	312	317	372	525
5	478	455	483	488	552	593	567	442	384	380	393	584
6	603	626	644	448	507	534	562	482	227	—034	507	409
7	522	567	515	528	512	570	535	478	501	430	543	593
8	442	428	429	430	440	476	522	469	398	474	304	431
9	528	532	524	530	499	549	559	443	363	237	247	391
10	532	586	457	440	517	535	528	474	471	376	418	522
11	492	492	502	548	594	616	636	497	430	340	256	432
12	550	613	578	543	571	580	604	700	511	398	350	427
13	613	578	560	561	593	616	622	573	484	359	440	621
14	613	546	564	606	634	656	617	533	493	493	544	531
15	524	519	507	521	558	572	532	425	372	385	445	577
16	599	587	551	597	616	680	689	510	489	552	499	419
17	730	375	291	436	225	274	212	213	—011	021	017	185
18	388	388	411	417	450	486	437	344	250	241	292	203
19	473	496	511	520	562	562	559	511	426	299	198	297
20	536	564	443	498	607	562	540	406	260	187	269	468
21	523	559	560	539	517	531	518	474	394	430	386	423
22	613	640	632	629	639	643	631	524	448	367	337	455
23	600	600	646	602	603	603	563	493	439	408	405	545
24	637	642	759	607	685	707	708	462	255	233	266	163
25	830	376	395	423	388	442	474	300	318	211	397	510
26	574	574	566	571	581	586	528	430	355	369	477	641
27	561	587	566	580	595	635	600	543	472	382	473	618
28	614	646	656	648	644	622	555	475	332	355	428	501
29	659	650	651	634	631	657	668	579	310	319	369	478
30	650	650	656	657	658	703	686	642	576	607	558	555
31	655	690	660	675	644	644	596	503	459	499	572	567
Mean	564	547	535	541	552	580	564	485	386	336	374	464

Force for the Month, 1891 July

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
July													
1	689	676	780	758	660	670	544	460	515	636	543	521	621
2	545	675	794	781	701	606	567	563	690	676	507	576	557
3	531	496	622	602	593	566	242	096	164	097	115	116	401
4	599	684	699	583	584	435	454	478	483	456	476	477	439
5	662	667	631	546	547	507	536	549	550	555	579	597	530
6	280	501	663	502	201	377	396	410	466	398	489	513	446
7	540	495	581	525	467	426	486	469	451	420	426	427	500
8	617	590	564	524	552	462	463	446	488	514	498	512	478
9	600	662	781	728	684	594	550	560	561	552	523	569	532
10	730	748	700	678	517	499	451	420	449	457	481	504	520
11	563	618	668	688	661	599	563	573	565	561	589	604	545
12	581	699	754	768	783	693	590	564	601	610	566	599	593
13	771	829	803	800	680	643	636	632	768	610	670	657	630
14	730	706	866	768	743	553	365	389	403	457	467	441	572
15	703	744	763	597	581	472	459	546	561	606	602	594	549
16	514	667	834	868	611	589	536	245	322	246	350	509	545
17	307	303	475	431	355	359	315	366	412	395	318	409	309
18	374	424	524	556	562	508	473	469	470	439	499	432	418
19	515	640	731	701	661	571	519	520	538	529	530	531	525
20	676	721	767	772	711	598	586	528	494	520	521	522	532
21	546	622	668	674	656	566	541	560	588	588	589	581	563
22	636	690	772	804	760	666	595	596	597	660	629	599	607
23	703	689	678	728	760	670	640	682	646	638	661	680	612
24	610	583	417	904	874	437	380	251	301	346	347	316	495
25	605	736	746	693	604	532	488	525	507	607	541	564	509
26	754	713	764	670	662	626	596	619	570	643	522	555	581
27	650	722	718	778	599	604	650	583	656	553	788	609	605
28	560	650	791	697	658	608	645	655	656	656	657	658	599
29	573	727	656	698	725	599	614	656	661	683	738	645	608
30	515	601	637	688	721	649	636	629	642	642	635	640	635
31	669	560	624	660	702	702	658	687	688	670	661	673	630
Mean	592	640	693	689	631	561	522	507	531	530	533	536	537

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
August												
1	663	663	664	665	699	744	745	682	598	539	558	671
2	830	885	800	742	712	748	789	799	630	521	513	587
3	614	605	638	603	572	455	618	524	390	206	068	077
4	650	520	571	409	505	577	541	457	314	278	356	469
5	498	453	552	490	536	550	474	337	189	197	306	492
6	700	637	615	616	613	617	573	466	269	359	590	654
7	659	669	678	667	627	622	628	498	382	301	406	573
8	583	587	584	666	653	680	663	502	161	040	171	397
9	620	624	629	622	609	636	542	521	477	217	173	335
10	634	601	643	617	542	555	560	530	382	252	163	389
11	484	858	643	531	610	528	597	314	531	504	491	430
12	637	606	593	613	632	538	556	422	243	158	104	385
13	516	489	531	518	613	618	597	431	338	338	474	502
14	..	..	..	..	..	..	..	..	..	..	..	..
15	611	611	576	608	569	573	425	166	382	252	428	515
16	579	611	563	531	577	582	533	319	090	073	268	525
17	543	547	499	496	501	510	457	364	238	185	227	403
18	588	593	607	604	609	699	624	445	252	293	321	466
19	556	673	670	667	717	686	624	490	324	270	208	195
20	561	611	522	460	506	533	484	355	212	212	293	429
21	624	619	603	599	587	591	511	319	054	149	204	357
22	539	547	513	559	564	564	539	467	288	203	433	363
23	606	602	603	604	609	601	579	476	396	374	451	561
24	522	553	599	600	610	615	553	473	357	294	268	440
25	675	670	676	677	673	718	629	464	244	163	237	340
26	616	580	446	528	574	578	553	478	316	213	236	341
27	548	553	549	533	516	516	490	387	276	244	326	404
28	558	544	545	519	547	538	468	374	280	235	286	359
29	—428	—068	104	110	264	331	363	194	—093	123	227	021
30	445	270	442	434	453	425	324	266	186	258	241	148
31	459	463	419	438	345	574	432	189	177	200	371	346
Mean	556	573	570	558	571	583	549	424	296	255	313	406

TABULAR RESULTS

F.65

Force for the Month, 1891 August

to .198000 dyne, gives the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
August													
1	830	862	976	774	734	630	623	714	773	809	806	820	718
2	835	772	863	477	757	496	339	484	629	634	657	658	673
3	344	516	705	481	464	384	397	372	467	503	644	645	471
4	524	565	750	666	582	590	542	579	566	535	567	654	532
5	654	695	700	697	622	622	618	610	575	580	581	662	529
6	672	717	732	752	770	671	650	628	629	580	626	668	617
7	605	740	741	675	671	658	596	458	467	445	437	501	571
8	677	691	678	729	662	564	560	543	517	534	613	618	545
9	535	670	683	860	718	628	588	589	414	473	550	538	552
10	534	655	706	725	596	551	557	603	545	514	474	497	534
11	363	453	454	595	605	551	547	526	482	558	564	551	532
12	471	624	656	681	623	573	534	665	509	482	518	511	514
13	...	...	...	...	...	...	...	...	...	...	...	...	} 521
14	547	715	571	667	370	550	461	409	482	514	523	735	
15	508	271	549	559	568	609	543	548	576	649	532	569	508
16	683	755	707	450	384	398	385	571	504	504	384	358	472
17	620	714	760	707	632	537	515	539	581	595	604	552	514
18	566	652	729	776	719	667	673	679	662	666	708	682	596
19	431	494	531	451	591	370	390	467	468	553	456	605	495
20	565	615	616	671	699	618	610	607	604	590	640	587	525
21	462	521	576	640	506	551	260	472	527	558	533	560	474
22	426	646	639	653	623	609	593	598	630	635	641	605	537
23	619	674	738	694	663	663	597	589	608	644	618	596	590
24	581	675	653	808	714	629	625	643	627	658	637	674	575
25	450	535	572	523	561	574	615	612	595	582	610	624	542
26	418	468	438	631	615	542	543	549	514	604	501	525	492
27	512	598	676	699	579	552	544	567	582	582	583	565	516
28	508	616	711	695	836	566	704	715	609	564	398	289	462
29	270	495	644	415	300	363	090	369	415	334	277	241	223
30	409	360	522	384	422	412	333	334	411	375	389	472	363
31	459	392	478	510	448	403	314	297	330	604	371	471	395
Mean	536	605	658	635	602	551	512	545	543	562	522	549	520

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Sept.												
1	449	503	405	464	493	366	457	004	139	122	154	047
2	376	377	295	364	420	230	362	133	—231	—230	—004	054
3	379	439	390	408	423	432	365	195	—021	—010	044	089
4	338	235	550	200	327	372	238	181	—039	—066	120	323
5	439	454	458	491	501	451	488	323	134	027	091	253
6	546	561	561	543	572	581	496	272	084	—019	049	143
7	518	483	474	470	449	526	477	334	132	034	115	148
8	596	660	670	580	561	586	546	376	201	117	225	261
9	372	319	409	352	420	591	489	180	—005	198	262	284
10	218	309	—141	108	325	105	083	039	—047	—131	—157	—189
11	119	267	290	291	283	494	325	195	181	—051	—172	—177
12	108	244	289	380	372	368	252	118	096	123	133	200
13	444	435	440	436	429	429	389	345	323	265	306	410
14	596	565	520	553	532	540	500	411	317	246	270	378
15	550	542	596	579	580	589	531	451	393	339	291	156
16	513	568	554	551	578	556	472	347	253	209	250	277
17	547	526	634	473	493	595	412	400	260	176	159	222
18	560	516	530	526	505	555	501	372	201	161	185	306
19	559	520	551	557	553	549	483	357	285	272	251	332
20	552	626	603	595	645	650	575	477	369	302	420	519
21	624	615	615	653	586	582	569	439	327	215	122	174
22	..	..	..	..	..	..	..	..	..	..	..	..
23	624	630	670	591	731	663	683	482	319	095	—039	187
24	481	356	396	506	538	592	499	419	355	311	295	385
25	557	562	589	613	645	614	543	476	427	392	388	407
26	654	615	655	576	631	541	736	561	453	404	154	121
27	577	601	596	642	643	584	613	519	429	367	355	476
28	597	491	612	554	623	583	184	661	522	172	153	002
29	399	319	364	419	347	240	381	327	183	009	041	145
30	357	350	407	453	499	293	398	200	196	147	319	333
Mean	471	472	482	480	507	492	450	331	215	145	165	216

TABULAR RESULTS

F.67

Force for the Month, 1891 September

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Sept.													
1	105	336	319	647	248	343	393	493	453	494	419	626	353
2	177	263	371	458	522	423	379	335	515	561	337	427	286
3	302	393	528	565	310	269	—189	189	254	105	277	084	259
4	508	644	599	528	507	466	435	472	431	455	398	425	360
5	380	552	597	575	531	490	510	533	533	530	531	531	433
6	267	411	501	506	512	495	477	497	483	488	466	489	416
7	329	510	604	613	561	547	563	515	532	565	570	588	444
8	352	394	520	444	522	486	131	051	042	137	155	261	370
9	367	336	161	287	343	239	303	—056	169	—167	014	—099	240
10	006	398	704	197	319	068	235	070	146	237	202	224	139
11	041	271	361	718	089	237	270	289	402	470	025	376	233
12	350	401	423	411	398	421	426	450	431	465	438	452	323
13	434	394	169	350	310	180	226	425	412	462	499	527	377
14	347	168	479	565	431	368	549	542	537	543	544	539	460
15	378	505	518	623	516	538	562	545	554	532	556	528	498
16	453	576	522	532	492	461	489	553	571	589	635	568	482
17	457	521	516	567	546	523	528	528	548	549	562	545	470
18	456	524	592	619	553	558	531	577	573	583	579	571	485
19	419	514	582	624	620	602	603	644	649	645	637	629	518
20	638	706	782	734	701	729	659	570	485	558	536	600	585
21	312	408	488	697	675	630	600	601	627	597	580	. .	510
22	424	326	678	790	679	665	635	636	627	645	629	701	620
23	263	238	508	331	514	505	528	479	516	485	486	666	465
24	498	499	621	640	546	519	587	431	517	558	568	568	487
25	448	570	634	661	689	703	704	687	705	661	648	585	580
26	275	223	466	309	383	405	441	551	501	592	522	526	471
27	518	398	573	587	584	453	446	504	320	321	561	588	511
28	155	418	215	455	042	113	137	359	336	175	550	248	348
29	295	488	521	489	400	473	483	416	435	395	499	310	349
30	312	456	465	461	386	431	486	505	492	533	570	494	398
Mean	342	428	501	533	464	445	438	463	460	450	466	468	412

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
October												
1	483	537	552	539	617	585	479	424	177	183	247	279
2	383	479	483	696	544	405	473	379	194	—030	120	174
3	467	409	540	496	636	636	520	378	198	095	105	096
4	506	526	575	572	595	595	515	350	205	062	018	122
5	572	587	609	596	611	584	545	415	266	168	065	079
6	607	644	639	645	663	666	570	414	274	114	065	115
7	623	624	655	629	653	612	573	569	295	—064	—099	074
8	802	465	645	646	688	647	599	532	451	173	255	323
9	503	454	490	482	573	596	525	454	314	194	145	199
10	781	310	602	751	694	639	609	453	359	251	212	248
11	536	555	568	564	593	593	562	514	432	429	448	502
12	692	670	703	690	682	637	543	562	526	424	361	191
13	460	354	534	517	563	603	595	484	398	336	346	393
14	622	605	609	610	648	648	599	510	460	376	323	394
15	583	598	594	613	664	654	628	539	436	347	339	353
16	637	679	683	692	689	685	641	556	470	459	405	558
17	666	676	690	691	714	723	693	635	519	506	457	372
18	637	702	743	680	767	736	723	630	495	361	299	353
19	668	624	583	598	576	572	577	417	372	328	369	454
20	554	524	510	651	674	674	509	483	406	222	305	346
21	642	671	621	658	681	685	637	540	440	369	379	419
22	673	692	705	711	712	712	676	520	318	247	374	436
23	720	671	712	727	763	881	814	743	356	447	. .	507
24	638	486	482	497	686	713	575	504	—216	—129	204	154
25	376	516	524	558	599	608	577	430	340	372	383	—018
26	536	614	623	606	742	674	648	541	424	354	021	291
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
30	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
31	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Mean	591	564	603	620	655	645	593	499	343	254	249	285

TABULAR RESULTS

F.69

Force for the Month, 1891 October

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
October													
1	258	299	416	381	413	463	414	555	533	493	408	445	424
2	275	397	473	447	372	484	440	522	432	487	583	574	408
3	164	282	480	526	541	514	546	578	466	440	419	441	416
4	218	349	434	521	427	491	545	573	587	592	616	585	441
5	156	329	450	506	542	470	561	599	554	563	564	564	456
6	223	418	661	563	618	626	623	611	626	652	622	649	513
7	199	505	510	551	552	503	500	456	497	555	548	552	461
8	284	285	316	281	349	467	503	536	563	568	583	651	484
9	322	448	516	504	545	509	650	497	565	611	442	387	455
10	403	533	502	615	621	616	563	524	542	534	508	535	517
11	603	729	874	636	623	659	674	683	665	666	667	673	603
12	520	576	602	634	438	474	389	516	575	540	500	594	543
13	518	604	604	610	606	620	652	627	596	587	598	674	537
14	450	460	455	501	578	336	589	630	563	618	587	709	537
15	444	512	580	612	622	649	663	678	678	661	666	653	574
16	649	637	713	692	644	684	690	703	691	669	665	656	635
17	499	603	666	704	731	745	737	711	693	675	695	668	645
18	534	611	769	621	622	847	408	300	206	382	460	640	564
19	604	636	523	484	247	310	486	568	586	520	607	503	509
20	414	585	618	304	534	632	616	657	693	645	641	714	538
21	569	611	606	625	689	698	713	714	714	701	666	666	613
22	572	659	745	764	810	828	806	641	672	741	714	837	649
23	535	513	401	578	173	337	408	508	473	028	290	493	525
24	425	260	291	365	154	276	642	485	525	634	743	581	416
25	347	416	362	457	567	598	306	389	654	660	498	521	460
26	387	122	437	358	456	513	589	598	572	469	659	614	494
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
Mean	407	476	539	532	518	552	566	572	574	565	575	599	516

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added
 .198000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Nov.												
1	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..
4	671	640	667	700	701	732	702	671	513	393	278	340
5	728	616	671	717	767	787	818	724	620	576	442	442
6	641	808	741	768	783	753	730	632	456	341	301	342
7	541	600	641	650	710	720	725	641	496	376	323	336
8	764	800	796	806	807	853	836	714	539	527	442	384
9	804	827	817	841	878	915	938	894	781	679	581	553
10	900	888	956	988	980	985	990	892	747	658	543	614
11	809	819	828	874	875	890	841	747	711	667	650	627
12	740	791	823	864	860	888	865	804	731	664	687	630
13	740	729	764	806	869	911	915	844	749	673	624	629
14	887	893	925	962	922	976	1013	744	950	748	852	776
15	851	663	672	750	790	868	791	653	589	459	663	690
16	846	842	816	830	839	809	859	787	706	602	581	648
17	832	829	792	848	902	839	799	593	562	517	455	455
18	804	737	760	842	874	902	866	773	669	543	539	513
19	866	866	831	867	904	874	883	829	718	673	619	601
20	722	555	466	245	512	918	824	770	348	132	170	317
21	586	712	583	583	912	864	684	640	721	550	1068	438
22	559	829	761	697	707	719	707	625	507	408	296	251
23	724	751	782	823	808	799	836	795	686	596	546	506
24	757	775	752	752	855	806	864	833	697	688	598	508
25	779	701	796	855	835	863	894	894	767	709	637	569
26	579	728	804	740	812	753	893	947	878	761	631	572
27	717	739	757	838	860	837	887	887	652	616	481	661
28	723	719	727	710	790	871	821	853	613	690	528	415
29	848	789	785	799	833	855	905	843	707	643	499	454
30	832	778	787	809	826	858	862	777	708	587	528	532
Mean	750	756	759	776	823	846	843	771	660	573	539	511

TABULAR RESULTS

F.71

Force for the Month, 1891 November

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Nov.													
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	445	550	621	658	673	704	696	670	621	612	568	504	600
5	484	593	669	680	671	614	547	593	575	652	694	671	640
6	478	573	663	714	773	787	747	757	757	627	552	544	636
7	517	645	702	834	835	813	828	801	815	811	803	798	665
8	430	476	620	752	860	869	821	840	857	872	869	833	724
9	636	709	763	854	864	909	918	919	911	889	904	895	820
10	683	725	739	675	786	808	844	760	805	856	825	843	812
11	714	691	849	858	887	873	865	870	789	749	726	771	791
12	729	811	869	919	948	952	899	791	841	872	851	775	817
13	729	774	784	878	951	834	867	831	899	873	900	851	809
14	803	822	710	724	801	833	794	690	700	713	628	792	819
15	714	641	710	755	886	724	860	829	816	1034	850	859	755
16	683	399	664	754	674	665	887	797	807	802	772	881	744
17	654	707	772	817	822	858	841	796	829	790	696	718	738
18	712	784	776	816	885	898	895	885	882	878	870	874	791
19	679	810	968	972	982	1158	1163	1019	764	999	801	743	858
20	188	066	409	607	694	550	654	654	633	705	697	756	525
21	—209	043	477	593	535	531	595	519	686	718	697	621	589
22	182	542	728	807	820	739	685	712	714	743	743	653	634
23	599	676	739	834	859	873	873	845	773	768	678	799	749
24	462	696	727	732	793	843	816	807	802	784	882	792	751
25	582	672	600	739	725	697	603	554	594	647	764	639	713
26	526	594	711	666	620	705	750	665	664	695	709	754	715
27	466	556	641	561	636	735	609	673	684	658	639	672	686
28	599	671	653	617	715	791	768	728	790	777	732	777	712
29	431	448	651	808	821	840	812	772	780	806	798	806	739
30	595	694	789	797	751	743	765	769	742	723	723	714	737
Mean	537	606	704	756	788	790	793	761	760	780	754	755	725

TABLE 6—Continued—*Hourly Values of the Horizontal*

The figures given in the table are millionths of a dyne, which, added

.198000+

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Dec.												
1	718	723	723	799	802	802	794	722	572	451	351	333
2	807	842	838	816	860	896	878	841	693	575	525	544
3	778	786	790	795	808	808	812	839	757	672	568	528
4	839	817	798	821	824	824	883	820	733	630	522	481
5	846	856	851	853	836	832	827	814	790	700	633	570
6	781	804	849	844	856	888	893	793	743	667	544	536
7	424	415	483	509	702	797	797	427	233	174	116	661
8	485	575	602	638	646	656	664	656	591	510	475	420
9	681	650	622	676	702	720	711	841	769	719	359	193
10	346	621	490	554	543	512	643	643	605	601	488	322
11	556	548	560	565	649	704	677	609	491	513	406	482
12	587	587	627	663	643	643	711	676	642	544	472	409
13	683	683	671	643	647	701	701	678	610	574	542	574
14	636	664	645	641	649	685	698	667	625	625	549	567
15	568	613	594	639	669	674	674	674	574	538	484	507
16	601	610	583	632	645	617	531	640	585	514	396	351
17	662	677	662	667	684	689	689	634	561	467	359	359
18	670	684	706	741	785	835	853	830	798	637	648	285
19	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..
21	405	301	567	500	670	764	648	674	552	502	242	268
22	488	519	529	538	608	686	577	708	485	562	230	77
23	581	617	617	613	621	657	630	643	566	399	215	84
24	580	620	611	656	624	646	678	651	673	384	218	150
25	609	618	604	603	693	667	630	662	593	490	273	228
26	612	666	662	693	701	701	706	714	668	484	281	322
27	578	588	619	646	627	627	667	636	621	509	343	351
28	635	604	630	616	660	656	665	679	642	661	426	434
29	588	561	508	548	592	642	619	619	591	506	375	420
30	659	555	555	569	636	616	730	563	778	553	418	351
31	535	417	566	611	641	651	624	619	583	456	280	321
Mean	619	628	640	658	690	710	711	689	626	539	405	384

Force for the Month, 1891 December

to .198000 dyne, give the absolute horizontal force in C-G-S units

.198000+

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Dec.													
1	481	530	665	751	754	777	777	791	776	758	741	758	681
2	614	624	754	804	852	781	821	807	792	802	757	752	761
3	643	752	851	869	895	886	886	886	863	853	844	840	792
4	566	714	826	867	839	866	853	848	847	843	834	838	781
5	650	798	825	888	864	829	819	797	801	756	761	783	791
6	629	701	805	899	898	808	705	665	493	653	416	474	723
7	880	875	627	938	685	775	749	694	504	355	455	509	574
8	590	699	779	707	747	819	819	774	742	719	737	697	656
9	183	489	673	637	519	461	478	501	527	370	392	302	549
10	352	551	573	663	662	630	612	540	305	260	580	620	530
11	455	540	594	535	635	625	607	517	570	620	634	597	570
12	336	416	624	682	663	636	650	650	644	604	662	684	602
13	613	631	595	645	648	622	684	734	692	674	638	616	646
14	467	458	336	571	537	497	488	578	591	636	559	573	581
15	447	479	497	614	658	666	527	595	571	563	589	639	586
16	400	463	625	659	693	672	672	676	657	640	652	644	590
17	447	552	609	691	676	694	703	708	693	666	666	652	619
18	...	...	...	...	...	...	...	...	...	...	...	...	615
19	...	...	...	...	...	...	...	...	...	...	...	...	
20	409	526	643	733	584	484	476	597	528	502	471	344	
21	263	429	511	456	559	600	600	451	571	509	509	621	507
22	260	242	440	611	552	543	466	560	528	654	641	564	503
23	183	308	493	605	655	677	663	658	609	568	545	581	533
24	257	392	541	635	630	711	679	666	588	615	620	570	558
25	277	372	525	628	645	672	672	654	640	622	613	618	567
26	429	474	559	541	603	666	617	608	575	553	598	616	585
27	491	481	567	639	656	656	619	566	610	606	637	610	581
28	456	515	573	605	608	586	595	617	603	554	513	585	588
29	419	472	567	595	634	639	634	561	593	646	543	520	558
30	224	170	364	426	484	470	493	502	568	599	523	519	514
31	428	514	523	554	616	598	548	495	457	467	494	445	518
Mean	443	523	606	671	671	667	652	645	619	609	608	606	609

TABLE 7—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
January												
1	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
2	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
3	1099	1082	1076	1102	1144	1196	1238	1248	1231	1163	1139	1147
4	1255	1246	1239	1247	1239	1215	1257	1301	1326	1275	1250	1242
5	1324	1324	1334	1351	1378	1386	1386	1362	1344	1278	1090	1143
6	1336	1344	1329	1362	1353	1346	1397	1440	1432	1364	1365	1382
7	1380	1388	1424	1431	1440	1458	1484	1527	1560	1519	1469	1469
8	1509	1526	1535	1527	1520	1502	1544	1571	1571	1536	1479	1505
9	1614	1605	1606	1615	1597	1590	1564	1540	1523	1514	1490	1498
10	1487	1513	1531	1531	1531	1532	1557	1592	1643	1675	1687	1695
11	1549	1557	1558	1550	1542	1525	1533	1543	1534	1492	1484	1493
12	1593	1610	1569	1552	1561	1570	1586	1587	1587	1579	1564	1564
13	1509	1509	1519	1510	1519	1529	1554	1564	1573	1547	1531	1513
14	1410	1401	1385	1368	1368	1244	1235	1219	1302	1328	1379	1405
15	1614	1614	1624	1624	1616	1616	1574	1532	1490	1466	1483	1484
16	1422	1422	1414	1414	1390	1390	1449	1510	1543	1477	1459	1478
17	1449	1465	1484	1475	1477	1476	1476	1469	1445	1402	1427	1437
18	1613	1630	1639	1631	1639	1632	1589	1564	1522	1471	1515	1515
19	1462	1453	1487	1402	1258	1210	1379	1465	1489	1447	1466	1431
20	1599	1573	1574	1566	1575	1583	1635	1653	1653	1620	1620	1586
21	1805	1805	1772	1763	1781	1790	1748	1715	1698	. .	1214	1180
22	1314	1314	1315	1306	1306	1307	1385	1487	1572	1538	1505	1497
23	1536	1536	1537	1521	1513	1513	1521	1506	1471	1438	1379	1348
24	1445	1462	1472	1472	1473	1464	1464	1448	1440	1415	1390	1399
25	1311	1293	1303	1303	1312	1321	1356	1381	1390	1366	1315	1289
26	1202	1218	1245	1262	1263	1298	1273	1298	1241	1265	1258	1293
27	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
28	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
29	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
30	1634	1634	1635	1635	1636	1636	1628	1611	1603	1536	1458	. .
31	1534	1534	1535	1544	1545	1536	1553	1580	1580	1564	1529	1529
Mean	1462	1464	1467	1464	1461	1456	1476	1489	1491	1451	1421	1421

Force for the Month, 1891 January

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
January													
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	1276	1318	1319	1285	1192	1219	1243	1228	1228	1228	1229	1237	1203
4	1312	1321	1322	1329	1313	1338	1330	1331	1315	1315	1298	1298	1288
5	1200	1254	1271	1281	1255	1298	1333	1367	1385	1368	1351	1343	1309
6	1442	1460	1469	1419	1394	1394	1420	1421	1412	1403	1396	1404	1433
7	. .	1631	1641	1607	1564	1574	1548	1524	1507	1516	1491	1491	1506
8	1540	1532	1524	1567	1592	1634	1635	1627	1620	1620	1621	1613	1560
9	1558	1669	1670	1662	1601	1586	1569	1545	1528	1519	1486	1477	1568
10	1611	1629	1646	1621	1561	1537	1537	1538	1538	1555	1548	1539	1576
11	1469	1470	1494	1530	1556	1572	1590	1607	1625	1608	1601	1592	1545
12	1607	1615	1599	1590	1557	1558	1567	1550	1541	1542	1517	1500	1549
13	1540	1591	1626	1584	1533	1508	1500	1458	1432	1416	1409	1409	1516
14	1482	1508	1551	1602	1636	1672	1680	1673	1655	1647	1631	1605	1474
15	1493	1511	1502	1401	1427	1418	1436	1428	1403	1411	1404	1421	1500
16	1571	1588	1631	1649	1572	1547	1531	1524	1498	1498	1533	1490	1500
17	1447	1456	1456	1448	1472	1507	1576	1516	1594	1602	1603	1603	1493
18	1490	1499	1534	1559	1543	1611	1653	1638	1646	1621	1588	1546	1579
19	1645	1661	1705	1723	1687	1689	1681	1682	1682	1614	1623	1598	1539
20	1612	1648	1664	1742	1784	1827	1820	1811	1821	1803	1804	1787	1682
21	1283	1300	1310	1301	1301	1302	1311	1312	1321	1321	1322	1313	1477
22	1565	1607	1677	1660	1634	1593	1585	1586	1568	1551	1552	1544	1499
23	1414	1448	1440	1467	1518	1577	1553	1535	1536	1494	1410	1428	1485
24	1365	1408	1451	1455	1443	1436	1401	1360	1343	1334	1327	1318	1415
25	1367	1383	1368	1334	1334	1343	1309	1293	1277	1268	1226	1175	1317
26	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1442
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	
29	. .	1629	1604	1664	1673	1699	1674	1649	1597	1607	1624	1633	
30	. .	. .	1793	1734	1691	1632	1591	1547	1532	1532	1533	1533	1608
31	1506	1556	1566	1557	1541	1532	1509	1483	1458	1458	1458	1458	1527
Mean	1469	1508	1532	1529	1514	1523	1522	1511	1502	1494	1484	1475	1483

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000+

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
February												
1	1467	1475	1468	1408	1384	1350	1401	1452	1495	1505	1496	1497
2	1605	1596	1622	1622	1631	1615	1615	1590	1556	1524	1498	1473
3	1616	1616	1599	1599	1583	1575	1575	1576	1558	1543	1543	1586
4	1541	1515	1507	1465	1440	1397	1373	1331	1305	1298	1255	1230
5	1320	1312	1297	1288	1289	1263	1263	1230	1179	1112	1104	1105
6	1272	1264	1265	1265	1266	1266	1325	1386	1411	1361	1293	1293
7	1452	1461	1470	1462	1454	1446	1471	1498	1498	1448	1422	1422
8	1590	1606	1599	1616	1626	1617	1592	1542	1508	1509	1586	1637
9	1584	1575	1568	1559	1560	1552	1534	1511	1468	1409	1409	1469
10	1534	1526	1519	1501	1485	1468	1485	1436	1375	1291	1309	1343
11	1451	1391	1359	1383	1436	1436	1445	1394	1352	1285	1277	1291
12	1334	1360	1378	1446	1464	1456	1472	1481	1448	1415	1415	1440
13	1464	1438	1380	1303	1381	1423	1440	1432	1406	1383	1374	1374
14	1677	1660	1602	1619	1603	1594	1646	1604	1595	1587	1639	1698
15	1593	1551	1382	1221	1094	1026	1255	1333	1418	1427	1411	1428
16	1554	1554	1563	1563	1582	1582	1590	1574	1540	1541	1566	1592
17	1827	1836	1820	1846	1863	1880	1889	1915	1907	1840	1831	1841
18	1753	1728	1703	1695	1696	1696	1781	1833	1867	1860	1860	1910
19	1704	1696	1705	1671	1655	1629	1655	1665	1673	1597	1546	1521
20	1467	1459	1434	1400	1384	1368	1359	1334	1308	1293	1285	1294
21	1223	1223	1224	1241	1251	1251	1310	1371	1413	1397	1278	1312
22	1276	1259	1260	1260	1261	1252	1286	1262	1244	1195	1195	1221
23	1294	1260	1278	1287	1314	1330	1288	1187	1084	1024	0992	1000
24	1238	1248	1239	1221	1240	1248	1240	1232	1172	1148	1131	1148
25	1357	1341	1334	1350	1368	1394	1394	1395	1344	1370	1370	1361
26	1529	1529	1530	1530	1531	1531	1506	1464	1405	1347	1347	1397
27	1362	1370	1363	1363	1356	1364	1313	1237	1152	1103	1077	1042
28	0913	0896	0896	0888	0880	0889	0889	0857	0788	0781	0738	0789
Mean	1464	1455	1442	1431	1431	1425	1443	1433	1410	1378	1366	1383

Force for the Month, 1891 February

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
February													
1	1446	1524	1601	1644	1687	1703	1670	1645	1636	1628	1612	1604	1533
2	1448	1517	1568	1612	1628	1637	1637	1630	1647	1639	1631	1606	1589
3	1663	1688	1689	1672	1664	1656	1623	1606	1606	1590	1582	1564	1607
4	1426	1469	1453	1453	1453	1454	1428	1403	1379	1354	1337	1328	1400
5	1147	1199	1250	1285	1319	1337	1397	1381	1313	1322	1297	1271	1262
6	1336	1388	1406	1414	1431	1441	1466	1493	1509	1460	1460	1451	1372
7	1381	1389	1399	1432	1467	1510	1536	1545	1562	1563	1581	1581	1477
8	1646	1655	1655	1639	1631	1632	1632	1607	1607	1599	1600	1592	1605
9	1513	1529	1496	1547	1565	1565	1539	1609	1625	1559	1533	1533	1534
10	1361	1386	1447	1472	1532	1558	1575	1542	1509	1491	1484	1466	1462
11	1371	1397	1406	1483	1509	1510	1544	1519	1502	1502	1503	1298	1419
12	1450	1501	1569	1569	1604	1579	1570	1555	1538	1548	1513	1479	1483
13	1400	1434	1470	1588	1664	1700	1734	1760	1760	1719	1702	1685	1517
14	1767	1784	1938	1887	1870	1880	1863	1881	1881	1847	1661	1653	1727
15	1505	1566	1617	1583	1568	1568	1541	1516	1500	1501	1526	1535	1444
16	1593	1585	1594	1653	1730	1790	1799	1774	1749	1767	1783	1801	1642
17	1518	1596	1672	1705	1749	1783	1783	1784	1784	1785	1785	1777	1792
18	1911	1911	1921	1912	1912	1922	1845	1787	1718	1711	1719	1711	1807
19	1539	1547	1532	1524	1507	1507	1533	1558	1542	1526	1509	1474	1584
20	1294	1320	1337	1320	1278	1288	1288	1271	1246	1229	1229	1221	1321
21	1347	1398	1450	1399	1322	1281	1290	1282	1282	1283	1283	1283	1308
22	1315	1331	1341	1358	1358	1376	1368	1334	1326	1319	1293	1285	1291
23	1054	1105	1123	1173	2225	1277	1259	1236	1227	1219	1228	1228	1196
24	1182	1208	1226	1244	1252	1245	1278	1279	1262	1289	1323	1356	1235
25	1301	1354	1381	1406	1424	1458	1475	1485	1502	1503	1528	1528	1405
26	1466	1492	1493	1476	1450	1426	1409	1393	1384	1385	1352	1343	1447
27	1027	1019	1011	1011	1002	0995	1003	0987	0970	0971	0946	0938	1083
28	0859	0867	0868	0860	0961	1081	1116	1117	1108	1075	1057	0967	0923
Mean	1402	1434	1461	1476	1491	1506	1507	1499	1488	1478	1466	1449	1443

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
March												
1	1025	0999	0992	0974	0958	0942	0916	0858	0782	0730	0714	0689
2	0728	0737	0747	0755	0697	0672	0655	0622	0545	0562	0052	0105
3	0595	0595	0579	0554	0554	0563	0563	0437	0428	0352	0285	0361
4	0520	0529	0615	0641	0641	0616	0616	0608	0582	0497	0507	0516
5	0717	0709	0718	0693	0609	0465	0474	0457	0516	0466	0458	0450
6	0626	0661	0721	0678	0662	0663	0713	0697	0714	0646	0604	0537
7	1146	1155	1139	1130	1139	1157	1165	1141	1115	1039	0997	1015
8	1250	1241	1225	1234	1235	1235	1286	1295	1329	1322	1330	1357
9	1176	1167	1160	1169	1169	1169	1178	1179	1136	1111	1112	1197
10	1339	1339	1340	1340	1322	1290	1332	1316	1274	1248	1224	1224
11	1357	1366	1375	1375	1368	1360	1395	1395	1395	1370	1344	1336
12	1360	1334	1310	1284	1284	1259	1336	1354	1295	1295	1313	1304
13	1574	1557	1490	1422	1438	1407	1533	1577	1577	1543	1502	1510
14	1397	1380	1330	1330	1313	1322	1348	1383	1341	1256	1154	1120
15	1202	1178	1144	1085	1102	1077	1137	1120	1146	1053	0918	0901
16	1104	0908	0773	0909	0977	1063	1054	1038	0987	0953	0920	0853
17	1292	1307	1301	1285	1250	1225	1277	1261	1261	1227	1168	1152
18	1141	1167	1244	1219	1150	1168	1168	1128	1076	1059	0992	1018
19	1653	1661	1731	1722	1696	1697	1714	1715	1749	1690	1691	1708
20	1509	1493	1501	1518	1552	1571	1638	1681	1690	1682	1674	1674
21	1666	1682	1700	1691	1683	1691	1700	1701	1684	1625	1651	1677
22	1633	1641	1616	1625	1634	1643	1617	1576	1525	1491	1458	1441
23	1498	1481	1253	1338	1406	1424	1483	1493	1552	1536	1536	1529
24	1620	1705	1698	1621	1637	1673	1741	1750	1750	1742	1777	1828
25	1774	1774	1801	1758	1708	1733	1836	1888	1880	1828	1744	1748
26	1257	1300	1378	1326	1335	1336	1336	1319	1260	1261	1202	1212
27	1319	1294	1295	1286	1328	1305	1321	1313	1321	1253	1212	1186
28	1032	1023	1024	1024	1067	1084	1068	1017	0983	0966	0924	0941
29	1025	1033	1008	1034	1043	1052	1018	1010	0943	0909	0935	0969
30	1171	1145	1087	1129	1129	1173	1165	1140	1055	1047	0997	1065
31	1241	1318	1251	1327	1369	1405	1396	1338	1278	1193	1093	1050
Mean	1224	1222	1211	1209	1208	1208	1232	1220	1199	1160	1112	1118

TABULAR RESULTS

F.79

Force for the Month, 1891 March

added to .578000 dyne, give the vertical force in C.G.S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
March													
1	0690	0715	0733	0733	0742	0768	0794	0803	0795	0787	0762	0745	0814
2	0249	0522	0675	0650	0617	0600	0558	0558	0543	0551	0560	0568	0564
3	0473	0489	0584	0618	0669	0704	0713	0739	0697	0714	0740	0689	0571
4	0568	0517	0603	0611	0739	0782	0782	0800	0775	0757	0734	0716	0636
5	0544	0638	0757	0758	0860	0945	0946	0767	0794	0786	0769	0719	0667
6	0937	0963	0998	1049	1108	1186	1204	1203	1195	1221	1204	1137	0889
7	1143	1168	1211	1229	1263	1289	1297	1290	1282	1274	1266	1249	1179
8	1297	1282	1273	1265	1283	1283	1278	1258	1224	1216	1209	1183	1266
9	1300	1325	1360	1393	1326	1310	1379	1422	1481	1430	1397	1355	1267
10	1284	1284	1294	1319	1353	1337	1346	1364	1364	1355	1356	1356	1317
11	1363	1389	1440	1449	1466	1449	1442	1433	1425	1401	1402	1367	1394
12	1271	1280	1348	1374	1315	1469	1766	1597	1682	1657	1624	1606	1405
13	1477	1485	1512	1528	1554	1555	1521	1506	1488	1480	1446	1430	1505
14	1197	1130	1207	1267	1267	1353	1361	1464	1583	1447	1321	1185	1311
15	0885	0902	1022	1107	1123	1185	1116	1151	1151	1151	1187	1169	1092
16	0998	1109	1254	1296	1415	1451	1467	1476	1537	1528	1486	1435	1166
17	1068	1187	1229	1307	1367	1407	1419	1343	1360	1284	1217	1183	1266
18	1342	1409	1547	1572	1641	1701	1675	1676	1659	1667	1677	1654	1365
19	1573	1607	1608	1625	1599	1600	1609	1610	1610	1601	1602	1560	1651
20	1744	1753	1702	1671	1711	1712	1636	1620	1679	1687	1672	1664	1643
21	1814	1814	1815	1798	1756	1739	1722	1697	1664	1647	1648	1639	1708
22	1502	1527	1597	1571	1579	1606	1529	1530	1505	1496	1506	1497	1556
23	1545	1640	1657	1735	1658	1736	1864	1847	1839	1839	1866	1820	1607
24	1846	1914	1897	2000	2085	2100	1975	1942	1883	1849	1841	1824	1821
25	1558	1575	1585	1593	1619	1629	1594	1587	1561	1569	1537	1503	1683
26	1194	1178	1213	1315	1383	1494	1452	1419	1394	1404	1361	1348	1319
27	1017	1009	1044	1077	1086	1096	1113	1088	1088	1065	1038	1056	1175
28	1036	1062	1079	1105	1105	1114	1106	1124	1115	1081	1023	1031	1047
29	1013	1106	1150	1183	1183	1193	1193	1184	1193	1151	1203	1220	1081
30	1133	1228	1339	1382	1433	1493	1502	1579	1647	1664	1410	1223	1264
31	1051	1110	1350	1553	1672	2022	1733	2014	1921	1836	1786	1701	1459
Mean	1168	1204	1261	1295	1322	1365	1358	1358	1359	1342	1318	1287	1248

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
April												
1	1251	1429	1455	1055	1217	1209	1455	1488	1480	1488	1455	1472
2	1370	1344	1517	1302	1412	1412	1438	1472	1472	1403	1285	1259
3	1379	1370	1327	1285	1318	1344	1395	1455	1514	1455	1379	1361
4	1464	1464	1421	1403	1429	1438	1464	1472	1395	1302	1200	1251
5	1276	1225	1251	1276	1276	1294	1327	1336	1268	1166	1098	1047
6	1225	1233	1225	1217	1225	1217	1259	1310	1242	1115	1021	0962
7	1072	1039	1047	1063	1063	1055	0996	1055	1055	0954	0869	0775
8	0826	0902	0681	0359	0503	0596	0656	0758	0766	0784	0869	0919
9	1285	1276	1259	1200	1200	1157	1209	1183	1268	1209	1225	1209
10	1464	1455	1361	1370	1446	1429	1480	1523	1549	1387	1276	1310
11	1497	1514	1523	1514	1531	1523	1549	1540	1497	1455	1370	1336
12	1667	1650	1608	1455	1455	1336	1318	1310	1310	1302	1353	1438
13	1608	1327	1455	1506	1642	1667	1727	1761	1812	1752	1642	1582
14	1616	1667	1667	1693	1684	1667	1658	1667	1642	1608	1565	1634
15	1913	1897	1905	1854	1812	1820	1837	1863	1795	1812	1778	1752
16	1854	1854	1854	1854	1854	1854	1905	1956	1982	1931	1889	1913
17	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
18	1913	1931	1905	1727	1761	1752	1812	1752	1591	1625	1608	1616
19	1939	1939	1939	1948	1965	1974	2033	2101	2160	2144	2024	2092
20	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
21	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
22	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
23	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
24	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
25	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
26	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
30	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Mean	1479	1473	1467	1393	1433	1430	1473	1500	1489	1438	1384	1385

TABULAR RESULTS

F.81

Force for the Month, 1891 April

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
April													
1	1403	1438	1455	1591	1582	1565	1599	1497	1514	1310	1285	1387	1420
2	1242	1259	1336	1421	1421	1446	1506	1421	1421	1421	1412	1361	1390
3	1379	1421	1523	1549	1608	1608	1523	1523	1582	1549	1514	1472	1451
4	1233	1285	1318	1370	1379	1370	1336	1370	1344	1318	1276	1259	1357
5	1157	1242	1276	1251	1174	1268	1242	1225	1242	1259	1233	1251	1236
6	0902	0978	1072	1166	1200	1233	1191	1157	1148	1124	1124	1098	1152
7	0681	0792	0817	0936	1055	1115	1063	1055	1063	1063	0877	0579	0964
8	1089	1421	1514	1523	1488	1488	1446	1455	1446	1336	1302	1276	1058
9	1531	1438	1472	1531	1557	1557	1497	1488	1497	1429	1395	1446	1355
10	1387	1421	1472	1497	1523	1549	1549	1549	1549	1549	1497	1506	1462
11	1276	1379	1488	1710	1676	1786	1837	1795	1761	1769	1743	1616	1570
12	1565	1658	1761	2126	2347	2288	2203	2083	1820	1804	1379	1225	1644
13	1650	1667	1676	1719	1812	1786	1752	1752	1752	1735	1743	1557	1670
14	1514	1540	1565	1658	1795	1871	1871	1863	1863	1880	1889	1897	1707
15	1549	1573	1667	1761	1812	1871	1871	1854	1828	1828	1846	1854	1806
16	.	.	.	.	.	.	.	.	.	.	.	.	} 1980
17	1752	2092	2092	2101	2220	2203	2050	2109	2135	2092	2033	1948	
18	1684	1752	1828	1913	1974	1998	1956	1939	1948	1965	1939	1939	1826
19	2144	2135	2168	2168	2152	2144	2092	2041	2050	2041	2041	2050	2062
20	.	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.
Mean	1397	1472	1528	1611	1654	1675	1677	1621	1609	1582	1529	1484	1508

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
May												
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
5	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
6	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
7	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
8	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
9	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
10	2139	2139	2071	2109	2139	2146	2172	2157	2157	2097	2067	2074
11	2031	2016	2008	2001	2023	2023	2004	2011	1996	1959	1936	1959
12	1946	1939	1931	1939	1946	1961	1942	1905	1882	1859	1859	1859
13	1959	1967	1959	1982	1997	2019	2014	1955	1880	1835	1805	1812
14	1627	1573	1746	1431	1402	1656	1651	1442	1504	1509	1539	1697
15	2517	2965	2449	2240	1392	1340	1402	1297	1214	1589	2122	2797
16	2784	2754	2746	2559	2431	2184	1939	2022	2037	1976	2037	2149
17	2309	2340	2369	2384	2407	2429	2402	2387	2357	2343	2260	2214
18	2224	2355	2293	2299	2292	2292	2273	2258	2175	2160	2168	2198
19	2079	2049	2065	2072	2086	2072	2075	2060	1993	1925	1939	1962
20	1897	1897	1882	1882	1905	1890	1923	1931	1952	1945	1885	1877
21	1790	1790	1819	1827	1834	1849	1822	1830	1814	1770	1739	1732
22	1795	1795	1803	1803	1803	1803	1813	1827	1820	1768	1693	1685
23	1635	1650	1620	1628	1650	1650	1653	1646	1653	1571	1511	1526
24	1595	1610	1624	1647	1670	1647	1606	1583	1531	1477	1410	1470
25	1458	1450	1480	1480	1495	1510	1528	1528	1521	1461	1446	1438
26	1380	1372	1372	1382	1395	1387	1406	1368	1315	1263	1233	1233
27	0928	0950	0980	0987	0920	0995	0983	0969	0908	0894	0840	0819
28	0596	0529	0529	0529	0566	0529	0553	0569	0546	0468	0478	0486
29	0938	0938	0931	0931	0924	0886	0874	0874	0837	0800	0810	0650
30	0794	0794	0794	0794	0794	0794	0767	0729	0670	0640	0685	0644
31	0718	0710	0687	0702	0732	0739	0765	0765	0728	0660	0525	0510
Mean	1688	1708	1689	1664	1627	1627	1617	1596	1568	1544	1545	1581

Force for the Month, 1891 May

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
May													
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
5	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
6	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
7	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
8	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
9	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
10	2040	2040	2047	2070	2072	2077	2095	2103	2088	2073	2036	2028	2093
11	1924	1939	1939	1947	1962	1962	1965	1957	1965	1957	1950	1950	1974
12	1945	1915	1937	1983	1990	1967	1963	1955	1948	1940	1955	1932	1933
13	1823	1863	1942	1996	2108	2108	2051	1968	1953	1924	1713	1608	1927
14	1933	1962	1985	1977	2045	2083	2453	3113	2761	2363	2557	2573	1942
15	3242	3542	3535	3325	3258	3130	3043	3051	3103	3141	3141	3074	2580
16	2370	3660	3127	2917	2752	2602	2598	2418	2395	2373	2343	2305	2478
17	2188	2225	2285	2338	2413	2413	2468	2386	2333	2318	2161	2153	2328
18	2128	2148	2163	2171	2171	2155	2151	2129	2137	2144	2137	2106	2197
19	1950	1950	1958	1988	2033	2055	2020	1999	1983	1886	1878	1893	1999
20	1821	1836	1836	1896	1926	1948	1921	1906	1883	1869	1846	1839	1891
21	1728	1750	1773	1825	1863	1923	1858	1813	1813	1799	1783	1783	1805
22	1605	1659	1718	1734	1763	1763	1744	1706	1676	1676	1594	1594	1735
23	1522	1543	1597	1611	1634	1656	1552	1629	1644	1637	1592	1577	1608
24	1473	1480	1488	1496	1526	1518	1491	1476	1469	1469	1462	1462	1528
25	1366	1369	1351	1381	1418	1397	1414	1369	1392	1377	1369	1354	1431
26	0861	0868	0913	1003	1026	1034	1029	0991	1006	0983	0976	0962	1157
27	0679	0656	0731	0724	0701	0701	0682	0637	0629	0614	0621	0621	0799
28	0654	0714	0781	0856	1014	1089	1167	1092	1092	1047	0942	0913	0739
29	0660	0735	0802	0892	0923	0900	0972	0865	0858	0820	0790	0790	0850
30	0568	0582	0650	0732	0838	0875	0856	0843	0818	0818	0773	0758	0750
31	0445	0520	0603	0603	0603	0603	0606	0606	0606	0584	0591	0591	0634
Mean	1589	1680	1689	1703	1729	1725	1732	1728	1707	1673	1645	1630	1654

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A											
	1	2	3	4	5	6	7	8	9	10	11	12
June												
1	0581	0565	0581	0565	0573	0584	0576	0523	0478	0388	0321	0328
2	0713	0728	0713	0728	0713	0731	0772	0597	0499	0447	0447	0468
3	0477	0508	0500	0500	0508	0518	0496	0473	0491	0461	0446	0493
4	0471	0473	0473	0393	0348	0329	0366	0381	0306	0276	0216	0201
5	0428	0407	0407	0414	0421	0477	0454	0431	0372	0162	0162	0206
6	0119	0156	0088	0119	0515	0572	0159	0143	0068	—0052	—0037	—0022
7	0033	0011	0026	0019	0019	0043	0059	0043	0036	—0046	—0174	—0121
8	—0044	—0075	—0067	—0023	—0015	—0020	—0027	0003	—0109	—0177	—0312	—0297
9	—0144	—0129	—0129	—0122	—0189	—0186	—0111	—0149	—0201	—0269	—0232	—0216
10	—0079	—0086	—0093	—0093	—0072	—0069	—0046	—0015	—0008	—0076	—0158	—0233
11	—0119	—0119	—0119	—0119	—0119	—0078	—0034	—0049	—0116	—0184	—0266	—0319
12	—0174	—0174	—0181	—0174	—0143	—0119	—0081	—0065	—0119	—0194	—0381	—0344
13	—0124	—0124	—0124	—0124	—0102	—0099	—0091	—0091	—0107	—0241	—0196	—0151
14	—0089	—0126	—0081	—0104	—0089	—0094	—0086	—0086	—0303	—0386	—0303	—0378
15	0112	0097	0104	0141	0179	0220	0243	0325	0280	0236	0160	0040
16	0814	0739	0784	0799	0784	0757	0855	0885	0848	0787	0773	0712
17	1308	1308	1308	1308	1270	1250	1295	1280	1250	1086	1100	1086
18	1320	1334	1379	1395	1454	1419	1405	1405	1323	1232	1202	1210
19	1408	1184	1229	1371	1477	1530	1523	1470	1411	1328	1305	1268
20	1533	1405	1180	1248	1442	1491	1528	1536	1513	1468	1461	1476
21	1471	1396	1441	1478	1553	1571	1594	1624	1579	1556	1451	1311
22	1454	1522	1566	1514	1589	1667	1675	1682	1682	1532	1375	1150
23	1687	1594	1610	1610	1631	1620	1657	1616	1515	1388	1357	1275
24	1698	1675	1712	1705	1735	1738	1745	1693	1655	1655	1580	1528
25	1754	1724	1794	1731	1747	1750	1742	1675	1607	1652	1720	1720
26	1392	1392	1452	1527	1557	1538	1553	1613	1598	1530	1485	1455
27	1353	1270	1398	1413	1428	1423	1393	1306	1306	1228	1183	1258
28	1149	1156	1156	1156	1170	1189	1166	1069	1031	0979	1002	0934
29	1086	1086	1086	1078	1093	1096	1096	1058	1028	0998	1021	1051
30	0953	0986	0978	0993	1038	1048	1034	1011	0973	0959	0884	0877
Mean	0751	0729	0739	0745	0784	0797	0797	0780	0730	0657	0623	0599

Force for the Month, 1891 June

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
June													
1	0504	0504	0587	0669	0699	0721	0732	0709	0709	0717	0694	0709	0584
2	0217	0217	0359	0457	0487	0494	0505	0505	0512	0528	0542	0512	0537
3	0169	0154	0191	0326	0379	0416	0419	0442	0419	0419	0404	0382	0416
4	0212	0287	0346	0377	0437	0429	0403	0403	0403	0403	0424	0417	0362
5	0188	0232	0277	0330	0270	0232	0318	0318	0266	0258	0017	0047	0296
6	—0004	0019	0033	0079	0079	0094	0090	0074	0052	0042	0059	0036	0107
7	—0081	—0081	—0006	0025	0039	0017	0080	0087	0080	0087	0057	—0040	0009
8	—0324	—0354	—0286	—0204	—0211	—0167	—0156	—0133	—0133	—0118	—0260	—0208	—0155
9	—0206	—0116	—0123	—0079	—0004	—0004	—0030	—0060	—0076	—0076	—0076	—0076	—0125
10	—0373	—0358	—0291	—0230	—0178	—0141	—0130	—0145	—0138	—0130	—0130	—0122	—0141
11	—0346	—0331	—0248	—0181	—0181	—0173	—0147	—0163	—0185	—0178	—0178	—0178	—0172
12	—0416	—0325	—0191	—0191	—0116	—0100	—0113	—0113	—0113	—0120	—0120	—0127	—0175
13	—0156	—0118	—0148	—0066	—0050	—0043	—0078	—0078	—0040	—0047	—0063	—0070	—0105
14	—0450	—0300	—0225	—0128	0097	0105	0116	0093	0093	0137	0137	0100	—0098
15	.	0268	0478	0606	0560	0718	0744	0842	0886	0819	0811	0811	0421
16	0701	0768	0776	0872	1308	1373	1341	1311	1318	1325	1311	1304	0969
17	1239	1246	1246	1314	1381	1396	1413	1399	1399	1399	1392	1384	1294
18	1347	1385	1333	1378	1415	1460	1456	1433	1448	1471	1500	1418	1380
19	1435	1458	1623	1848	1789	1803	1731	1649	1619	1521	1431	1506	1497
20	1359	1502	1546	1554	1591	1577	1549	1542	1549	1519	1512	1489	1482
21	1349	1372	1515	1665	1761	1747	1772	1697	1668	1652	1645	1570	1560
22	1153	1228	1355	1399	1528	1572	1598	1583	1598	1583	1590	1583	1507
23	1360	1391	1480	1578	1660	1735	1753	1746	1738	1738	1738	1738	1592
24	1546	1575	1658	1741	1816	1823	1782	1751	1766	1759	1759	1759	1702
25	1475	1453	1512	1655	1798	1678	1651	1598	1583	1583	1515	1501	1651
26	1338	1375	1458	1443	1458	1481	1528	1528	1491	1476	1461	1446	1482
27	1021	1081	1194	1246	1221	1183	1166	1166	1159	1159	1152	1145	1244
28	0944	0951	1005	0989	1012	1034	1052	1052	1060	1052	1067	1067	1060
29	0896	0971	1001	1001	0963	0971	0982	0974	0974	0997	0997	0966	1061
30	0887	0932	0984	1037	1089	1112	1129	1100	1085	1070	1070	1047	1012
Mean	0585	0613	0651	0750	0773	0818	0822	0810	0806	0802	0790	0777	0738

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
July												
1	1042	1036	1043	1089	1113	1113	1106	1121	1107	1077	1041	0995
2	1424	1445	1454	1462	1522	1560	1606	1652	1607	1562	1579	1525
3	1563	1563	1564	1564	1580	1632	1641	1633	1590	1461	1395	1403
4	1913	1899	1892	1892	1901	1915	1886	1864	1835	1820	1806	1854
5	1829	1821	1815	1822	1839	1839	1877	1869	1862	1773	1759	1744
6	1803	1803	1729	1662	1753	1790	1784	1746	1762	1740	1711	1626
7	1864	1839	1832	1847	1833	1833	1819	1804	1760	1716	1694	1694
8	1904	1882	1883	1897	1929	1921	1960	1974	2013	1968	1939	1887
9	1721	1706	1677	1677	1693	1739	1769	1807	1778	1755	1704	1656
10	1621	1592	1563	1608	1623	1623	1617	1624	1625	1596	1514	1484
11	1530	1522	1523	1539	1554	1561	1562	1593	1563	1542	1475	1457
12	1414	1362	1340	1378	1409	1416	1410	1357	1358	1306	1269	1269
13	1472	1457	1451	1466	1497	1511	1483	1505	1506	1454	1305	1282
14	1426	1418	1411	1464	1480	1495	1518	1488	1392	1324	1325	1325
15	1565	1550	1535	1551	1590	1611	1628	1591	1501	1404	1405	1464
16	1353	1345	1331	1323	1324	1310	1304	1266	1207	1132	1140	1133
17	1006	0931	0947	0932	0925	0843	0724	0671	0770	0837	0951	1033
18	1228	1230	1221	1229	1237	1253	1231	1223	1217	1217	1218	1195
19	1181	1173	1190	1190	1198	1198	1192	1184	1177	1162	1163	1156
20	1194	1194	1195	1224	1255	1248	1280	1301	1258	1146	1012	0960
21	1160	1153	1161	1161	1178	1185	1179	1171	1127	1097	1076	1076
22	1196	1181	1182	1190	1213	1229	1244	1237	1208	1163	1119	1074
23	1142	1157	1143	1143	1151	1174	1175	1152	1094	1056	0982	0989
24	1177	1169	1147	1132	1118	1058	1105	1112	1023	0993	1024	1024
25	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
26	1330	1322	1323	1308	1317	1287	1273	1273	1298	1282	1215	1192
27	1229	1219	1223	1216	1238	1231	1225	1218	1211	1211	1197	1166
28	1242	1257	1266	1273	1274	1274	1238	1208	1186	1089	1029	1008
29	1218	1218	1219	1219	1220	1220	1236	1251	1259	1177	1148	1178
30	1290	1290	1283	1275	1284	1292	1270	1256	1219	1166	1115	1100
31	1243	1243	1229	1221	1222	1245	1231	1208	1179	1097	1060	1008
Mean	1409	1399	1392	1398	1416	1420	1419	1412	1390	1377	1312	1298

Force for the Month, 1891 July

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
July													
1	0936	0936	0997	1155	1321	1411	1420	1434	1421	1398	1347	1376	1168
2	1451	1467	1558	1618	1657	1626	1583	1590	1591	1568	1539	1554	1550
3	1344	1419	1555	1675	1878	2065	2366	2382	2008	1985	1934	1911	1713
4	1807	1851	1868	1860	1907	1951	1900	1877	1855	1863	1842	1827	1870
5	1602	1564	1678	1746	1807	1814	1815	1815	1816	1809	1802	1802	1788
6	1547	1637	1795	1938	1991	1953	1917	1895	1888	1888	1837	1844	1793
7	1672	1672	1778	1853	1922	1922	1930	1923	1901	1909	1902	1902	1826
8	1753	1760	1828	1874	1852	1845	1830	1809	1802	1787	1765	1736	1867
9	1480	1539	1631	1676	1691	1670	1655	1648	1626	1626	1619	1612	1673
10	1268	1327	1457	1494	1510	1554	1563	1555	1542	1527	1513	1520	1539
11	1453	1333	1402	1470	1500	1500	1472	1441	1442	1427	1428	1420	1487
12	1285	1331	1384	1428	1475	1512	1492	1461	1462	1462	1463	1463	1396
13	1186	1223	1314	1352	1390	1428	1429	1406	1423	1415	1424	1401	1308
14	1303	1484	1508	1552	1613	1621	1599	1577	1578	1563	1556	1556	1482
15	1533	1556	1527	1557	1542	1498	1468	1431	1410	1387	1374	1351	1502
16	0984	1157	1270	1285	1346	1384	1406	1377	1325	1251	1237	1244	1310
17	1207	1222	1246	1253	1261	1276	1269	1269	1249	1249	1242	1234	1065
18	1182	1211	1287	1295	1288	1251	1229	1192	1193	1193	1179	1187	1224
19	1195	1247	1292	1285	1309	1316	1280	1250	1228	1213	1207	1214	1217
20	0922	0960	1043	1103	1127	1142	1136	1136	1151	1137	1138	1138	1142
21	1054	1084	1160	1198	1266	1251	1207	1200	1186	1163	1179	1187	1161
22	1052	1052	1105	1188	1249	1242	1190	1145	1139	1145	1140	1140	1168
23	1103	1178	1216	1216	1225	1233	1195	1181	1189	1189	1176	1168	1151
24	.	.	.	.	.	.	.	.	.	.	.	.	} 1199
25	1203	1278	1324	1331	1355	1325	1303	1295	1312	1312	1328	1328	
26	1186	1216	1262	1299	1240	1211	1219	1219	1250	1213	1206	1221	1257
27	1183	1175	1222	1297	1350	1319	1291	1306	1307	1308	1203	1143	1238
28	1121	1159	1204	1242	1243	1250	1214	1214	1215	1200	1208	1208	1201
29	1216	1314	1323	1330	1324	1278	1271	1257	1272	1280	1281	1289	1217
30	1093	1168	1199	1222	1268	1268	1262	1239	1247	1247	1256	1241	1233
31	0956	0979	1025	1032	1056	1049	1027	1019	1020	1020	1021	1014	1100
Mean	1276	1316	1392	1427	1465	1472	1464	1451	1434	1424	1411	1408	1399

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
August												
1	1022	1022	1023	1023	1039	1055	1077	1100	1116	1049	0960	0870
2	0968	0953	0961	0976	0939	0947	0963	0971	0972	0874	0860	0883
3	1190	1137	0786	0733	0899	0772	0908	1020	1119	1141	1008	0958
4	0903	0993	1054	1001	1032	1100	1094	1071	1064	0952	0848	0833
5	0954	0946	0955	1014	1068	1098	1114	1091	1017	0979	0936	0921
6	1085	1063	1064	1071	1095	1110	1111	1051	0962	0834	0821	0873
7	1068	1068	1069	1069	1085	1085	1101	1132	1125	1050	0976	0953
8	1096	1111	1143	1090	1113	1121	1122	1077	1048	0996	0922	0884
9	1191	1191	1192	1192	1193	1208	1201	1134	1029	1015	1030	1046
10	1234	1234	1227	1205	1228	1206	1214	1237	1230	1223	1209	1172
11	1307	1209	1202	1323	1369	1353	1317	1317	1318	1355	1387	1432
12	1342	1371	1402	1410	1403	1396	1404	1412	1375	1240	1234	1279
13	1242	1272	1288	1243	1221	1274	1275	1275	1209	1096	1067	1067
14	.	.	.	.	.	.	.	.	.	.	.	.
15	1199	1214	1208	1185	1171	1194	1233	1195	1151	1031	0942	0964
16	1287	1257	1273	1296	1320	1320	1350	1343	1239	1134	1180	1262
17	1277	1308	1339	1339	1362	1377	1371	1363	1304	1260	1200	1103
18	1275	1268	1276	1276	1277	1299	1292	1300	1256	1143	1144	1152
19	1281	1281	1289	1289	1297	1312	1328	1298	1232	1149	1090	1105
20	1271	1278	1287	1279	1317	1340	1318	1274	1223	1132	1081	1156
21	1223	1231	1224	1216	1240	1255	1263	1256	1204	1152	1198	1145
22	1266	1190	1259	1259	1268	1268	1254	1224	1157	1082	1113	1136
23	1271	1264	1272	1280	1296	1326	1327	1297	1261	1178	1171	1201
24	1396	1411	1397	1389	1398	1405	1384	1354	1325	1287	1206	1228
25	1296	1289	1283	1283	1291	1306	1262	1164	1068	0978	0926	0889
26	0987	0979	0980	0980	0989	1011	1020	1005	0983	0945	0902	0879
27	1007	1007	1008	1008	1009	1023	1024	1002	0936	0920	0914	0906
28	1004	1004	1021	1035	1036	1051	1037	0992	0926	0906	0945	0990
29	0597	0658	0988	1011	0914	0960	0930	0900	0833	0834	0880	0947
30	1007	1022	0978	1030	1047	1039	1048	1040	1011	0913	0944	0989
31	0983	0930	0886	0916	0887	0910	0925	0918	0889	0866	0838	0852
Mean	1141	1152	1144	1149	1160	1171	1175	1160	1119	1057	1031	1036

Force for the Month, 1891 August

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
August													
1	0759	0856	0962	1074	0970	0932	0912	0941	0957	0957	0958	0958	0983
2	0959	1064	1223	1185	1351	1261	1269	1209	1210	1195	1189	1181	1065
3	0843	0896	1039	1189	1265	1333	1281	1229	1185	1147	1006	0916	1045
4	0849	0886	0969	1023	1083	1099	1069	1047	1055	1040	1019	0952	1002
5	0899	0974	1036	1043	1096	1126	1120	1105	1106	1091	1099	1092	1028
6	0889	0941	1017	1077	1101	1086	1057	1034	1051	1051	1052	1059	1023
7	0924	0954	1053	1098	1137	1151	1122	1107	1139	1048	1079	1094	1070
8	0877	0975	1043	1081	1134	1127	1158	1128	1152	1173	1174	1174	1080
9	1092	1114	1115	1175	1259	1244	1230	1230	1246	1096	1202	1217	1160
10	1157	1210	1324	1421	1452	1414	1385	1370	1386	1394	1395	1365	1287
11	1283	1220	1381	1441	1495	1495	1451	1421	1437	1422	1423	1416	1366
12	1340	1348	1318	1333	1350	1342	1313	1290	1299	1299	1307	1300	1338
13	.	.	.	.	.	.	.	.	.	.	.	.	} 1224
14	1043	1126	1164	1202	1308	1360	1346	1324	1310	1265	1243	1146	
15	1145	1257	1326	1319	1313	1342	1276	1260	1284	1284	1255	1278	1209
16	1263	1270	1421	1467	1513	1513	1454	1409	1357	1372	1351	1313	1332
17	1179	1216	1300	1307	1285	1285	1265	1249	1258	1258	1259	1259	1280
18	1243	1303	1342	1319	1305	1268	1239	1239	1262	1270	1271	1271	1262
19	1046	1137	1182	1235	1446	1514	1394	1379	1358	1312	1299	1261	1271
20	1127	1179	1263	1278	1271	1256	1242	1205	1229	1221	1222	1214	1236
21	1109	1146	1200	1275	1321	1373	1315	1307	1308	1300	1256	1264	1241
22	1175	1182	1190	1205	1229	1252	1230	1215	1238	1238	1255	1255	1214
23	1225	1270	1331	1346	1347	1340	1370	1378	1379	1386	1387	1395	1304
24	1275	1304	1335	1358	1336	1329	1285	1300	1293	1286	1294	1294	1329
25	1010	1017	1033	1056	1072	1027	1005	0998	0999	0984	0985	0985	1092
26	0903	0940	0979	1009	1040	1003	0973	0988	0989	0974	0975	0990	0976
27	0959	0945	0953	0968	0977	1007	0970	0978	0971	0979	0972	0980	0976
28	1078	1101	1102	1086	1155	1147	1066	1043	1074	0932	0903	0400	1001
29	1241	1361	1377	1422	1385	1310	1319	1176	1139	1095	1044	1036	1057
30	1013	1005	1044	1059	1037	1075	1031	1046	1039	1047	1302	1340	1046
31	0936	0981	1027	1034	1020	1028	1013	1006	1007	0902	0956	0978	0945
Mean	1061	1106	1168	1203	1235	1234	1205	1187	1190	1167	1171	1143	1149

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Sept.												
1	0988	0965	1022	1038	1047	1024	1057	1041	0986	0971	0916	0972
2	0751	0888	0921	0841	0906	0995	0932	0908	0853	0814	0831	0895
3	1081	1090	1099	1099	1108	1117	1110	1094	1031	1032	0985	1009
4	1164	1037	0877	0918	0983	1104	1169	1137	1114	1123	1148	1148
5	1230	1239	1240	1224	1209	1210	1227	1227	1212	1189	1158	1150
6	1233	1242	1235	1235	1220	1245	1254	1230	1223	1184	1145	1177
7	1275	1276	1285	1293	1302	1311	1336	1328	1313	1258	1243	1267
8	1182	1174	1168	1168	1169	1194	1187	1179	1148	1069	1038	1022
9	0920	1041	1050	1042	1051	0964	0861	0685	0694	0799	0888	0872
10	0619	0660	0165	0173	0446	0591	0760	0816	0849	0810	0747	0803
11	0893	0926	0967	0951	0840	0761	0834	0778	0779	0772	0837	0901
12	1064	1113	1114	1100	1075	1052	1029	1005	0966	0943	0944	0944
13	1058	1067	1068	1068	1077	1086	1087	1071	1080	1065	1035	1018
14	1101	1102	1103	1103	1112	1121	1114	1098	1083	1076	1053	1005
15	0975	0976	0953	0953	0850	0755	0756	0756	0789	0790	0807	0839
16	0898	0899	0900	0900	0901	0902	0919	0927	0936	0945	0962	0946
17	0925	0934	0855	0879	0896	0873	0826	0810	0835	0852	0853	0869
18	0911	0912	0921	0929	0914	0947	0932	0900	0885	0870	0839	0879
19	0986	0987	0988	0988	0989	1006	1053	1047	0992	0945	0962	1002
20	0988	0981	0982	0982	0991	1000	1001	0977	0954	0875	0876	0908
21	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
22	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
23	1020	1013	0998	0966	0935	0880	0857	0857	0922	0915	0916	0972
24	0958	0975	1024	1080	1089	1098	1091	1083	1100	1085	1086	1110
25	1169	1170	1163	1163	1156	1173	1142	1118	1127	1112	1105	1097
26	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
27	1182	1183	1184	1176	1169	1146	1163	1147	1132	1117	1078	1095
28	1256	1241	1242	1197	1227	1252	1069	0941	1014	1055	1120	1192
29	1195	1212	1253	1293	1254	1206	1160	1216	1297	1304	1323	1323
30	1181	1182	1183	1191	1200	1145	1146	1162	1187	1172	1213	1181
Mean	1045	1055	1036	1035	1041	1043	1040	1020	1019	1005	1004	1022

TABULAR RESULTS

F.91

Force for the Month, 1891 September

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Sept.													
1	1053	1118	1151	1247	1304	1297	1242	1210	1123	1044	0885	0725	1059
2	0976	1073	1138	1194	1195	1148	1109	1125	1062	1015	1024	1040	0985
3	1122	1139	1188	1252	1357	1542	1583	1471	1192	1225	1274	1258	1186
4	1213	1214	1167	1183	1200	1201	1194	1202	1203	1188	1197	1205	1137
5	1191	1192	1209	1241	1250	1243	1228	1220	1221	1222	1231	1231	1216
6	1234	1243	1300	1332	1309	1318	1295	1271	1296	1297	1266	1274	1252
7	1236	1292	1318	1294	1239	1192	1169	1169	1186	1171	1172	1164	1254
8	1047	1048	1185	1257	1234	1259	1268	1276	1317	1286	1263	1101	1178
9	0865	0930	1059	1179	1268	1429	1278	1222	1111	1016	1041	0841	1004
10	0900	1005	1046	1142	1183	1248	1249	1265	1242	1163	1004	0852	0864
11	0974	1079	1208	1688	1593	1258	1147	1139	1092	1061	0934	1054	1011
12	0969	0994	1043	1051	1044	1037	1030	1030	1039	1032	1049	1049	1026
13	1043	1076	1125	1157	1166	1167	1160	1120	1097	1090	1099	1115	1091
14	0950	0983	0984	1040	1089	1050	1019	0995	0980	0989	0982	0982	1046
15	0864	0873	0874	0890	0891	0916	0901	0909	0894	0879	0880	0880	0826
16	0979	0972	1005	0989	1030	0991	0960	0960	0953	0954	0923	0883	0943
17	0846	0879	0904	0920	0913	0890	0883	0891	0900	0893	0900	0900	0882
18	0936	0985	1026	1034	1003	0964	0965	0973	0966	0967	0968	0968	0941
19	1019	1028	1005	1013	1014	0991	0976	0984	0985	0978	0987	1003	0997
20	0981	0990	0991	0983	0976	0977	0986	1010	1075	. .	. .	. .	0976
21	0944	1009	1040	1040	1043	1004	0997	1005	1006	1007	1024	. .	(*)
22	0898	0947	0964	0980	0989	1006	0999	0991	1000	1009	1018	1018	
23	1045	1078	1095	1119	1096	1081	1082	1074	1091	1084	1101	1013	1009
24	1167	1160	1121	1137	1146	1162	1163	1172	1173	1174	1167	1167	1112
25	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	} 1152
26	1076	1077	1150	1182	1247	1216	1185	1185	1170	1123	1156	1180	
27	1167	1200	1241	1249	1274	1259	1276	1276	1301	1294	1247	1255	1200
28	1457	1594	1515	1555	1804	1557	1582	1478	1423	1376	1169	1169	1312
29	1348	1357	1342	1342	1311	1280	1273	1273	1266	1235	1148	1156	1265
30	1158	1151	1112	1120	1081	1090	1051	1051	1044	1029	1014	0990	1127
Mean	1067	1101	1130	1177	1193	1176	1158	1147	1119	1107	1080	1056	1078

* Omitted in getting means

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
October												
1	0972	1030	1031	1025	1011	1028	1006	0984	0994	0963	0925	0894
2	0763	0733	0742	0752	0730	0755	0821	0895	0936	0946	0948	0949
3	1017	1027	1012	0998	0992	1009	1003	1069	1078	1048	1026	1083
4	1064	1066	1059	1061	1063	1080	1130	1108	1085	1055	1049	1050
5	1127	1121	1114	1084	1070	1095	1113	1131	1164	1126	1080	1073
6	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
7	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
8	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
9	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
10	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
11	1337	1339	1345	1347	1344	1345	1357	1374	1375	1352	1298	1273
12	1401	1414	1415	1412	1398	1394	1396	1393	1394	1371	1322	1323
13	1252	1320	1378	1389	1381	1403	1399	1381	1372	1353	1345	1346
14	1439	1425	1416	1418	1430	1421	1428	1435	1436	1454	1425	1416
15	1371	1413	1414	1427	1423	1430	1447	1439	1470	1442	1413	1378
16	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
17	1504	1506	1532	1529	1536	1542	1544	1546	1568	1544	1536	1537
18	1553	1545	1551	1553	1560	1571	1588	1565	1556	1502	1498	1473
19	1546	1563	1610	1622	1624	1625	1627	1624	1605	1556	1553	1559
20	1641	1546	1578	1621	1617	1598	1661	1653	1654	1610	1576	1603
21	1623	1594	1636	1664	1671	1682	1699	1696	1677	1643	1594	1549
22	1662	1664	1660	1667	1664	1670	1682	1684	1655	1606	1546	1532
23	1584	1611	1622	1629	1631	1617	1624	1647	1632	1604	1649	1693
24	1551	1563	1677	1684	1619	1707	1775	1772	1763	1786	1731	1651
25	1718	1750	1716	1723	1791	1818	1835	1811	1802	1789	1735	1705
26	1715	1768	1805	1781	1747	1769	1801	1773	1779	1750	1722	1753
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
30	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
31	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Mean	1393	1400	1415	1419	1415	1428	1447	1449	1450	1425	1399	1392

Force for the Month, 1891 October

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
October													
1	0895	0945	0962	0980	0974	0975	0969	0947	0924	0926	0912	0857	0964
2	1014	1046	1039	1059	1029	1030	1032	1026	1019	1021	1007	0976	0928
3	0980	0982	0991	1033	1051	1044	1046	1048	1057	0995	1029	1022	1027
4	1075	1117	1142	1160	1162	1155	1149	1135	1128	1122	1076	1109	1100
5	1082	1067	1053	1039	1033	1026	1020	1014	0999	1001	1003	1004	1068
6	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
7	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
8	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
9	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
10	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
11	1259	1266	1298	1341	1348	1374	1386	1399	1384	1381	1388	1394	1346
12	1283	1387	1483	1420	1463	1479	1497	1494	1469	1435	1458	1387	1412
13	1378	1365	1423	1419	1380	1386	1429	1415	1433	1418	1420	1396	1383
14	1386	1414	1445	1431	1444	1461	1436	1429	1435	1422	1413	1358	1426
15	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1461
16	1473	1475	1502	1514	1501	1522	1509	1501	1502	1494	1501	1507	
17	1633	1545	1572	1579	1581	1587	1579	1555	1546	1548	1565	1571	1554
18	1521	1528	1539	1567	1589	1605	1745	1783	1789	1801	1721	1549	1594
19	1585	1628	1629	1692	1740	1746	1784	1730	1716	1707	1674	1665	1642
20	1604	1642	1648	1685	1682	1688	1716	1708	1693	1680	1672	1647	1643
21	1565	1613	1635	1642	1654	1670	1667	1659	1655	1662	1659	1665	1645
22	1436	1469	1526	1548	1550	1567	1579	1586	1592	1604	1596	1551	1596
23	1592	1630	1692	1776	2181	2080	2082	2033	1922	1919	1992	1993	1768
24	1693	1786	1844	1968	1975	2007	1953	1970	1935	1912	1699	1695	1780
25	1716	1749	1786	1818	1846	1857	1859	1866	1852	1793	1800	1796	1789
26	1719	1782	1849	1851	1879	1859	1831	1792	1798	1800	1766	1720	1784
27	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
29	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
30	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
31	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Mean	1394	1422	1457	1476	1503	1506	1514	1504	1493	1482	1467	1443	1446

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Nov.												
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	1800	1792	1760	1851	1844	1828	1829	1821	1773	1734	1693	1644
6	1833	1785	1802	1819	1820	1821	1846	1846	1798	1692	1619	1561
7	1817	1802	1827	1819	1828	1829	1829	1814	1767	1709	1686	1678
8	1819	1812	1820	1829	1838	1839	1840	1824	1801	1778	1711	1704
9	1804	1813	1822	1806	1791	1774	1774	1801	1818	1769	1736	1721
10	1771	1780	1789	1781	1774	1767	1758	1759	1752	1745	1671	1672
11	1887	1905	1913	1906	1907	1899	1884	1868	1853	1804	1764	1748
12	1888	1913	1923	1923	1924	1916	1892	1869	1846	1780	1740	1765
13	1839	1858	1867	1859	1860	1869	188	1862	1821	1864	1741	1749
14	1792	1784	1777	1769	1778	1771	1764	1739	1675	1618	1603	1603
15	1645	1703	1761	1761	1771	1763	1748	1707	1716	1627	1669	1685
16	1776	1777	1787	1803	1779	1772	1790	1781	1758	1701	1694	1702
17	1893	1902	1902	1887	1888	1880	1890	1881	1866	1842	1786	1827
18	1795	1755	1723	1764	1790	1815	1849	1866	1842	1818	1811	1762
19	1820	1821	1822	1814	1831	1832	1842	1842	1834	1794	1763	1754
20	1665	1568	1470	1347	1365	1439	1563	1645	1622	1639	1648	1657
21	1675	1536	1562	1480	1473	1523	1639	1655	1640	1633	1642	1666
22	1864	1709	1768	1833	1851	1860	1877	1877	1886	1855	1847	1847
23	1922	1923	1932	1924	1925	1893	1894	1886	1854	1839	1873	1897
24	1833	1818	1811	1803	1787	1788	1822	1822	1831	1808	1792	1809
25	1760	1794	1795	1795	1804	1822	1823	1790	1774	1759	1744	1727
26	1777	1745	1714	1738	1739	1740	1749	1766	1775	1743	1728	1736
27	1746	1780	1797	1789	1790	1783	1784	1800	1809	1827	1811	1828
28	1943	1936	1929	1937	1889	1890	1883	1883	1867	1860	1869	1869
29	1862	1898	1905	1889	1906	1874	1851	1818	1786	1771	1780	1763
30	1772	1773	1766	1774	1792	1801	1835	1843	1852	1853	1846	1846
Mean	1808	1795	1798	1796	1798	1800	1813	1810	1793	1764	1741	1739

TABULAR RESULTS

F.95

Force for the Month, 1891 November

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Nov.													
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
5	1653	1745	1827	1835	1836	1862	1912	1912	1897	1865	1858	1833	1809
6	1587	1653	1736	1778	1779	1796	1798	1805	1806	1807	1800	1800	1766
7	1679	1712	1764	1796	1805	1830	1823	1823	1816	1809	1802	1802	1786
8	1729	1755	1798	1830	1839	1840	1841	1825	1826	1811	1804	1796	1805
9	1738	1772	1807	1815	1808	1783	1768	1768	1769	1778	1771	1771	1782
10	1731	1831	1872	1864	1873	1866	1867	1875	1884	1902	1886	1894	1807
11	1781	1823	1858	1874	1851	1852	1853	1853	1862	1879	1880	1880	1858
12	1823	1858	1899	1899	1892	1877	1894	1902	1911	1880	1865	1847	1872
13	1717	1743	1776	1785	1810	1836	1829	1829	1813	1814	1807	1799	1818
14	1645	1728	1745	1770	1754	1772	1781	1806	1839	1883	1809	1702	1746
15	1703	1771	1779	1795	1788	1830	1831	1798	1783	1734	1752	1744	1744
16	1785	1819	1878	1869	1911	1938	1955	1931	1890	1874	1884	1884	1822
17	1853	1862	1879	1863	1864	1889	1899	1882	1875	1843	1844	1820	1868
18	1837	1879	1888	1863	1840	1833	1842	1842	1835	1836	1828	1820	1822
19	1796	1830	1831	1839	1840	1866	1834	1834	1852	1762	1813	1772	1818
20	1781	1847	1914	1906	1833	1850	1827	1810	1819	1804	1805	1797	1693
21	1741	1996	1956	1997	1990	1975	1967	1927	1936	1920	1905	1880	1763
22	1898	1923	1916	1932	1933	1943	1952	1935	1928	1896	1906	1922	1882
23	1857	1850	1908	1908	1877	1886	1886	1870	1871	1864	1849	1841	1885
24	1842	1852	1861	1836	1837	1838	1839	1831	1824	1817	1768	1752	1818
25	1753	1819	1894	1878	1846	1822	1832	1832	1849	1842	1835	1785	1807
26	1778	1812	1829	1829	1830	1856	1865	1857	1833	1801	1770	1729	1781
27	1853	1863	1905	1954	1955	1956	1939	1957	1950	1951	1943	1935	1863
28	1911	1921	1930	1946	1939	1965	1957	1933	1901	1886	1878	1862	1908
29	1789	1847	1857	1873	1833	1818	1843	1835	1820	1837	1830	1813	1837
30	1855	1864	1874	1841	1809	1810	1811	1803	1804	1805	1806	1814	1819
Mean	1781	1822	1853	1861	1853	1861	1863	1857	1854	1842	1835	1819	1815

TABLE 7—Continued—*Hourly Values of the Vertical*

The figures given in the table are millionths of a dyne, which,

.578000 +

D A Y of the MONTH	Hours, A. M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Dec.												
1	1888	1905	1906	1906	1932	1923	1942	1942	1935	1903	1888	1888
2	1888	1873	1882	1899	1908	1892	1877	1844	1829	1830	1814	1798
3	1849	1858	1867	1859	1860	1861	1862	1854	1855	1840	1816	1791
4	1751	1769	1794	1794	1795	1796	1781	1748	1692	1693	1710	1702
5	1768	1761	1770	1762	1755	1748	1749	1765	1750	1734	1694	1694
6	1753	1771	1764	1764	1773	1766	1775	1767	1749	1736	1688	1688
7	1770	1763	1748	1658	1437	1364	1382	1447	1580	1654	1623	1754
8	1837	1870	1871	1863	1864	1857	1850	1825	1761	1745	1730	1730
9	1747	1764	1765	1765	1750	1726	1703	1678	1679	1656	1648	1648
10	1756	1717	1669	1751	1719	1761	1811	1795	1787	1772	1707	1732
11	1823	1816	1809	1825	1818	1811	1795	1812	1788	1723	1716	1683
12	1824	1825	1826	1834	1835	1836	1837	1837	1821	1790	1766	1733
13	1833	1851	1852	1844	1787	1780	1797	1806	1782	1734	1727	1735
14	1826	1802	1828	1836	1837	1854	1871	1864	1832	1816	1792	1776
15	1769	1762	1771	1763	1764	1765	1790	1815	1800	1784	1750	1734
16	1762	1747	1773	1781	1765	1758	1759	1784	1793	1745	1703	1719
17	1747	1748	1740	1740	1741	1742	1735	1743	1744	1729	1714	1689
18	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
19	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
20	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
21	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
22	1998	1974	1901	1844	1869	1920	1937	1970	2045	2029	2022	2038
23	1990	1966	1951	1951	1960	1961	1970	1995	2004	1964	1973	1973
24	1982	1983	1976	1984	2002	1970	2028	2069	2079	2006	1966	1982
25	1984	1985	1986	1970	1987	1996	2005	2030	2031	2016	1983	1983
26	2026	2027	2035	2044	2045	2030	2031	2022	2007	1951	1935	1993
27	1985	1978	1979	1946	1972	1965	1974	1990	1983	1959	1903	1911
28	1978	1979	1988	1988	1972	1965	1950	1933	1902	1903	1854	1846
29	1922	1923	1907	1899	1900	1918	1919	1919	1903	1880	1823	1840
30	1709	1891	1924	1933	1917	1910	1903	1886	1855	1839	1840	1848
31	1931	1940	1958	1958	1967	1968	1953	1928	1886	1848	1841	1849
Mean	1855	1861	1861	1858	1849	1846	1851	1854	1847	1825	1801	1806

Force for the Month, 1891 December

added to .578000 dyne, give the vertical force in C-G-S units

.578000 +

D A Y of the MONTH	Hours, P. M.												DAILY MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	
Dec.													
1	1913	1939	1923	1907	1908	1925	1926	1926	1919	1920	1921	1905	1916
2	1815	1841	1857	1850	1859	1869	1861	1853	1846	1855	1848	1856	1860
3	1727	1761	1778	1786	1787	1780	1765	1773	1766	1767	1759	1751	1807
4	1711	1745	1754	1762	1763	1772	1773	1773	1774	1775	1776	1760	1757
5	1712	1745	1787	1779	1747	1765	1766	1782	1759	1776	1752	1744	1753
6	1730	1772	1789	1773	1774	1783	1808	1841	1875	1892	1877	1844	1781
7	1738	1756	1773	1806	1799	1824	1842	1850	1859	1860	1845	1828	1707
8	1731	1748	1757	1757	1775	1792	1777	1760	1745	1771	1755	1755	1789
9	1682	1732	1815	1824	1816	1834	1859	1843	1844	1861	1748	1756	1756
10	1807	1832	1833	1833	1818	1835	1836	1853	1895	1896	1872	1823	1796
11	1693	1743	1768	1785	1802	1828	1862	1853	1879	1855	1856	1832	1799
12	1775	1809	1843	1843	1827	1837	1838	1838	1839	1840	1816	1816	1820
13	1777	1827	1828	1828	1862	1887	1897	1872	1857	1858	1834	1826	1820
14	1777	1811	1861	1796	1813	1822	1823	1815	1800	1784	1777	1785	1817
15	1786	1861	1895	1854	1830	1815	1808	1791	1792	1793	1786	1761	1793
16	1755	1781	1782	1782	1774	1816	1817	1793	1769	1770	1763	1738	1768
17	1739	1773	1782	1741	1709	1727	1744	1736	1737	1730	1731	1739	1738
18	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
19	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
20	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
21	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
22	2031	2098	2107	1984	1969	1994	2020	2028	2013	1956	1982	1990	1988
23	2024	2041	2067	2050	2043	2060	2037	2029	2005	1990	1982	1982	1999
24	2016	2033	2059	2075	2076	2069	2062	2037	2016	2015	2008	1999	2021
25	2009	2019	2052	2085	2078	2112	2096	2072	2056	2041	2017	2017	2025
26	2043	2052	2028	2012	2021	2022	2007	2007	2008	1992	1993	1993	2014
27	1961	1979	1988	1980	1956	1982	1999	2007	2008	1985	1969	1961	1972
28	1880	1914	1898	1890	1891	1925	1926	1934	1927	1928	1904	1904	1924
29	1873	1892	1916	1926	1934	1968	1952	1960	1945	1946	1955	1931	1915
30	1849	1834	1843	1860	1877	1903	1912	1920	1921	1906	1890	1907	1878
31	1899	1917	1901	1893	1869	1887	1880	1896	1889	1898	1899	1907	1907
Mean	1832	1861	1877	1869	1866	1883	1885	1883	1879	1876	1864	1856	1856

TABLE 8—*Observations for Horizontal Intensity Made with Magnetometer No. 42 (Elliott Bros.)*

CIVIL DATE	EASTERN STAND-ARD TIME	HORIZONTAL FORCE MAGNETOGR.		VIBRATION EXPERIMENT				DEFLECTION EXPERIMENT			HORIZONTAL INTENSITY C-G-S units		
		Ordi-nate of trace	Temp. C	Time 1 vib. uncor-rected	Temp. mag-net C	Scale value of 90° tor-sion	Rate of chron.	Def. mag-net at distance of 0.3 ^m	Def. mag-net at distance of 0.4 ^m	Temp. C	Calcu-lated from def. at 0.3 ^m	Calcu-lated from def. at 0.4 ^m	Mean
1891	h m	mm	. °	s	°		s	° ' "	° ' "	°			
Jan. 7	1 40 pm	84.9	16.7	4.304444	8.8	2.97	—4.87	16 23 42.5	6 50 55	8.2	.198609	.198715	.198662
8	12 24 pm	83.3	16.3	4.309305	10.9	1.65	—4.87	16 23 10	6 50 50	12.6	.198354	.198427	.198390
24	1 20 pm	81.9	18.0	4.309768	10.7	1.76	—3.00	16 22 55	6 51 10	11.3	.198420	.198388	.198404
26	11 50 am	81.1	15.3	4.305602	6.0	1.80	—3.00	16 26 25	6 52 15	6.9	.198251	.198303	.198277
Feb. 9	12 06 pm	81.5	17.9	4.310000	11.0	1.81	—2.63	16 22 20	6 50 30	12.4	.198420	.198492	.198456
25	12 21 pm	77.8	19.8	4.316851	17.5	1.38	2.62	16 19 25	6 49 10	17.7	.198470	.198567	.198523
Mar. 10	12 30 pm	77.1	17.1	4.305787	7.6	1.86	—4.04	16 24 07.5	6 51 07.5	9.4	.198427	.198524	.198475
25	11 50 am	71.8	19.9	4.314426	13.8	1.17	—2.07	16 21 35	6 50 15	14.8	.198333	.198391	.198362
26	11 09 am	75.4	19.0	4.308633	10.5	1.23	—2.07	16 22 15	6 50 37	13.0	.198452	.198487	.198470
Apr. 15	1 10 pm	67.4	22.0	4.327407	26.2	1.02	+0.17	16 15 00	6 47 55	26.2	.198475	.198423	.198449
16	11 43 am	70.9	22.8	4.321204	19.7	1.08	+0.17	16 17 42.5	6 48 12.5	21.1	.198419	.198564	.198491
May 11	12 58 pm	70.5	23.6	4.321667	23.6	1.34	—0.50	16 14 12.5	6 47 17.5	25.3	.198714	.198735	.198724
12	11 11 am	68.7	24.9	4.318657	18.2	1.42	—0.50	16 17 07.5	6 48 47.5	19.3	.198598	.198545	.198572
27	11 47 am	70.0	23.5	4.319074	19.2	1.39	—0.23	16 16 37.5	6 47 55	20.8	.198586	.198694	.198640
28	11 40 am	67.8	23.3	4.320093	18.0	1.21	—0.23	16 17 10	6 48 42.5	19.9	.198473	.198444	.198459
June 10	1 45 pm	64.5	25.6	4.323657	23.1	1.08	—0.34	16 14 37.5	6 47 30	24.7	.198597	.198609	.198603
July 15	11 47 am	46.0	34.1	4.329352	26.7	.80	—1.19	16 11 12.5	6 46 10	28.3	.198546	.198601	.198573
17	10 56 am	37.8	30.7	4.329907	23.7	.95	—1.19	16 17 57.5	6 49 07.5	23.7	.197942	.197948	.198945
Aug. 21	11 13 am	26.2	32.1	4.332407	25.4	.73	—1.61	16 14 07.5	6 47 47.5	25.8	.198188	.198138	.198163
22	12 00 m	29.7	32.0	4.330185	27.0	.81	—1.61	16 13 07.5	6 47 12.5	26.7	.198426	.198418	.198422
Oct. 9	1 20 pm	13.4	28.2	4.324028	19.5	1.31	—1.61	16 16 57.5	6 48 32.5	19.5	.198409	.198411	.198410
Nov. 19	11 23 am	11.0	23.8	4.308518	9.1	2.38	—2.89	16 22 20	6 50 27.5	12.2	.198548	.198548	.198548
20	2 51 pm	6.0	24.6	4.322037	15.5	2.03	—2.89	16 20 20	6 49 20	16.2	.198434	.198433	.198433
27	12 28 pm	6.3	25.0	4.322685	18.2	1.55	—2.89	16 17 32.5	6 48 35	17.3	.198567	.198567	.198567
Dec. 23	11 07 am	21.37	24.9	4.319676	16.3	1.70	—3.00	16 19 02.5	6 49 30	18.5	.198209	.198210	.198209

TABLE 9—*Observations for Inclination (Dip)*

CIVIL DATE	EASTERN STANDARD TIME	HORIZONTAL FORCE MAGNETOGRAPH		VERTICAL FORCE MAGNETOGRAPH		NEEDLE	INCLINATION (DIP)
		Ordinate of trace	Temp. C	Ordinate of trace	Temp. C		
1891	h m	mm	°	mm	°		° ' "
Jan. 7	12 25 p m	82.8	16.5	78.9	16.1	5	71 08 00
	2 45 p m	87.8	16.6	78.7	16.2	5	71 04 49
8	11 04 a m	82.1	16.3	78.4	15.9	5 ^a	71 07 11
	1 35 p m	85.5	16.4	78.0	16.1	6 ^a	71 04 38
24	11 51 a m	78.1	18.0	89.7	17.6	5 ^a	71 05 41
	2 32 p m	82.2	18.1	89.3	17.8	6 ^a	71 05 49
26	10 29 a m	83.8	15.4	78.9	15.0	6 ^a	71 07 56
	2 17 p m	85.8	15.8	78.7	15.4	5 ^a	71 04 53
Feb. 9	10 36 a m	81.5	17.8	90.9	17.5	5 ^a	71 05 34
	1 50 p m	76.8	17.9	89.2	17.6	6 ^a	71 06 41
25	10 49 a m	78.0	19.6	101.1	19.3	6 ^a	71 07 23
	1 47 p m	78.1	19.9	102.1	19.6	5 ^a	71 04 08
Mar. 10	10 52 a m	76.5	17.1	92.5	16.8	5 ^a	71 03 38
	2 51 p m	80.7	17.2	92.4	16.9	6 ^a	71 05 26
25	10 16 a m	71.7	19.8	99.4	19.3	6 ^a	71 07 04
	1 50 p m	76.5	19.8	102.1	19.4	5 ^a	71 05 41
26	9 45 a m	76.5	19.1	101.8	18.6	5 ^a	71 03 11
	2 40 p m	79.8	19.0	102.7	18.7	6 ^a	71 03 06
Apr. 15	11 21 a m	64.8	21.9	108.4	21.6	6 ^a	71 04 09
	2 43 p m	70.0	22.1	111.1	21.8	5 ^a	71 06 19
16	10 12 a m	70.3	22.6	111.9	22.3	5 ^a	71 01 06
	2 32 p m	72.0	22.8	113.9	22.5	6 ^a	71 04 28
29	10 54 a m	68.5	22.9	.	22.5	5 ^a	71 07 02
May 11	11 18 a m	64.3	24.8	56.2	24.6	5 ^a	71 09 15
	2 46 p m	70.7	24.8	56.8	24.6	6 ^a	71 05 49
12	9 50 a m	65.7	24.9	57.4	24.6	6 ^a	71 08 21
	1 57 p m	72.0	24.7	56.3	24.4	5 ^a	71 02 49
27	10 09 a m	67.1	23.7	70.2	23.3	5 ^a	71 04 54
	2 20 p m	74.0	23.5	73.1	23.1	6 ^a	71 04 38
28	9 54 a m	64.3	23.2	75.3	22.8	6 ^a	71 03 45
	2 46 p m	66.3	23.3	72.0	22.9	5 ^a	71 02 28

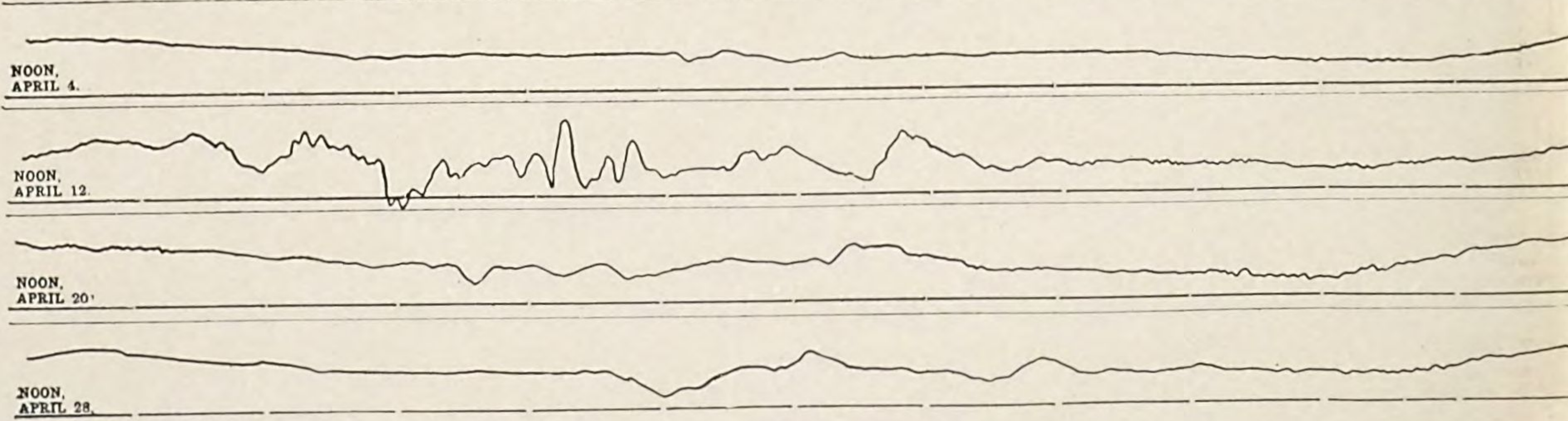
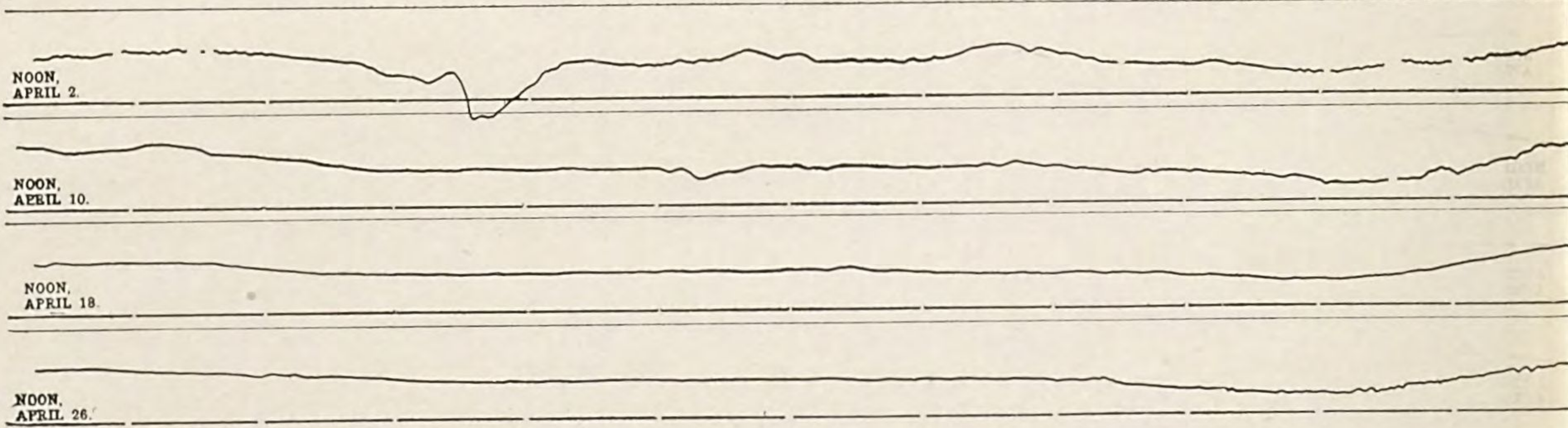
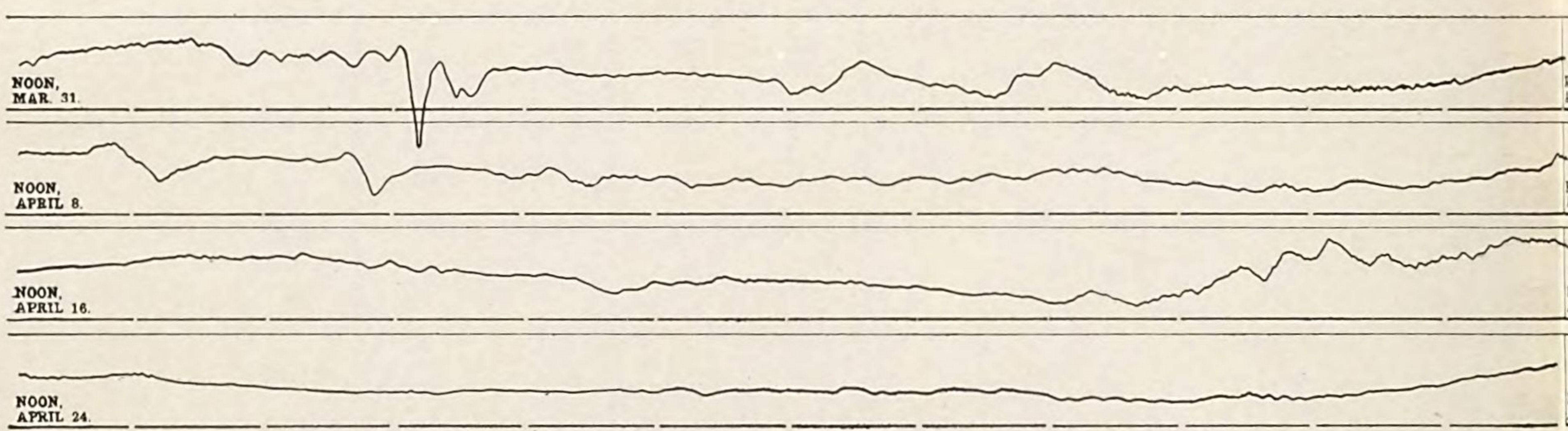
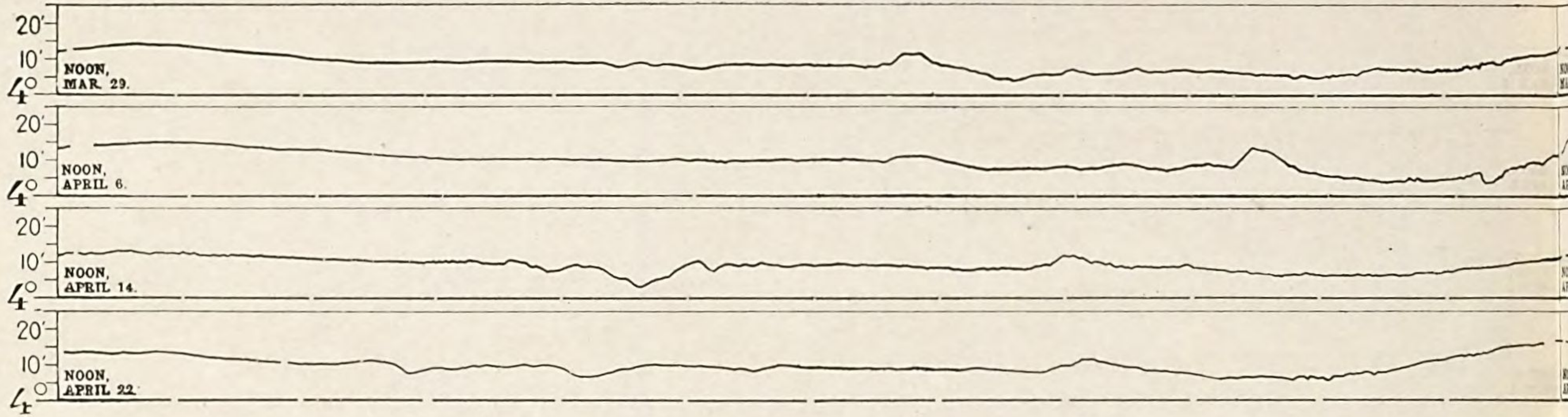
TABLE 9—*Observations for Inclination (Dip)*—Continued

CIVIL DATE	EASTERN STANDARD TIME	HORIZONTAL FORCE MAGNETOGRAPH		VERTICAL FORCE MAGNETOGRAPH		NEEDLE	INCLINATION (DIP)
		Ordinate of trace	Temp. C	Ordinate of trace	Temp. C		
1891	h m	mm	°	mm	°		° ' "
June 10	11 02 a m	62.0	25.7	90.8	25.4	6 ^a	71 02 34
	3 12 p m	66.0	25.8	92.6	25.5	5 ^a	71 03 32
July 15	10 00 a m	42.3	34.0	92.6	33.6	5 ^a	70 58 38*
	2 15 p m	50.2	33.0	89.2	32.4	6 ^a	71 05 06
17	9 52 a m	36.6	30.8	94.5	30.3	6 ^a	71 06 41
	2 20 p m	43.3	30.8	89.1	30.3	5 ^a	71 03 24
Aug. 21	10 00 a m	23.8	32.1	97.9	31.8	5 ^a	71 04 49
	1 33 p m	30.2	32.0	97.8	31.7	6 ^a	71 07 00
22	10 54 a m	29.6	32.0	98.0	31.7	6 ^a	71 05 39
	2 06 p m	33.8	32.0	97.0	31.7	5 ^a	71 00 24
Oct. 9	11 25 a m	8.8	28.5	114.3	28.0	6 ^a	71 07 43
Nov. 19	10 06 a m	12.5	23.8	47.1	23.3	5 ^a	71 05 38
	3 09 p m	18.4	24.0	47.1	23.6	6 ^a	71 02 23
20	11 40 a m	1.7	24.2	50.3	23.8	6 ^a	71 08 21
27	11 01 a m	6.7	24.9	52.0	24.7	5 ^a	71 04 49
	2 00 p m	7.6	25.4	52.4	25.3	5 ^a	71 07 00
Dec. 23	9 44 a m	27.9	24.7	54.5	24.3	5 ^a	71 05 13
	2 40 p m	25.9	25.0	54.6	24.9	6 ^a	71 06 23
24	10 59 a m	19.8	26.0	58.1	25.8	6 ^a	71 09 39

* Thrown out.

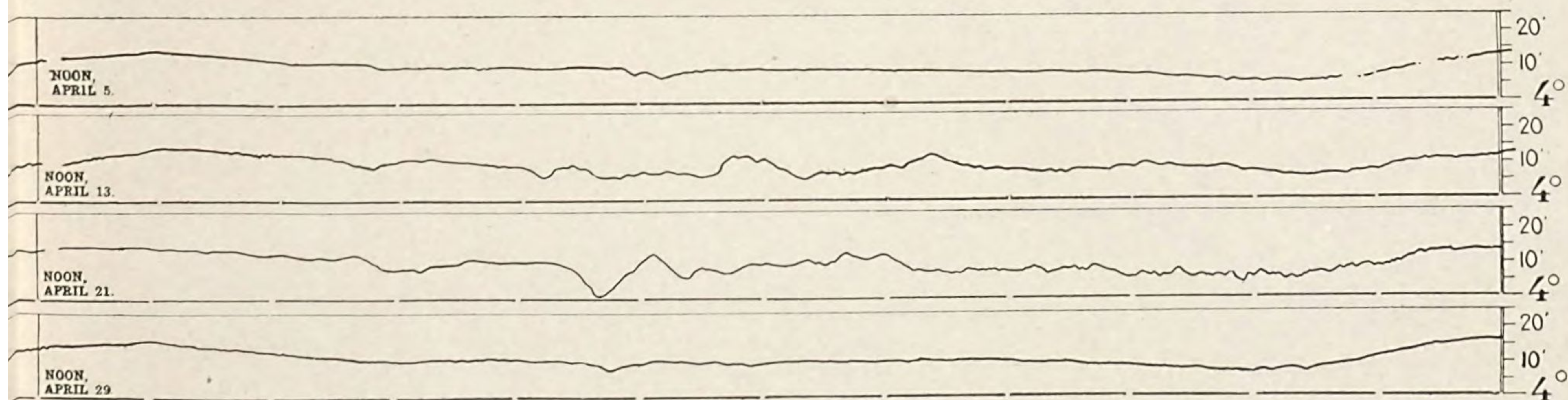
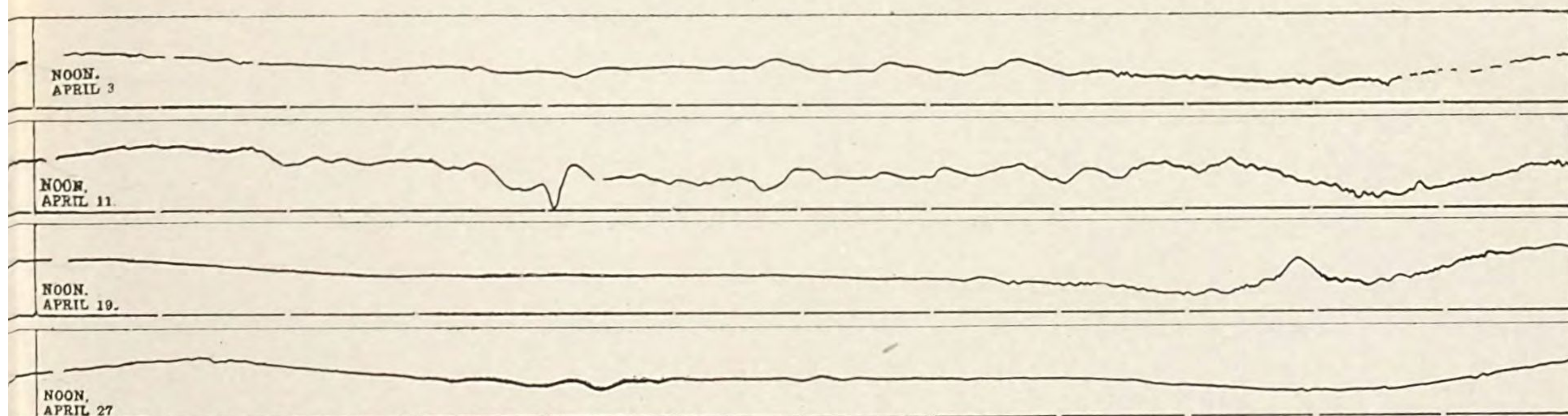
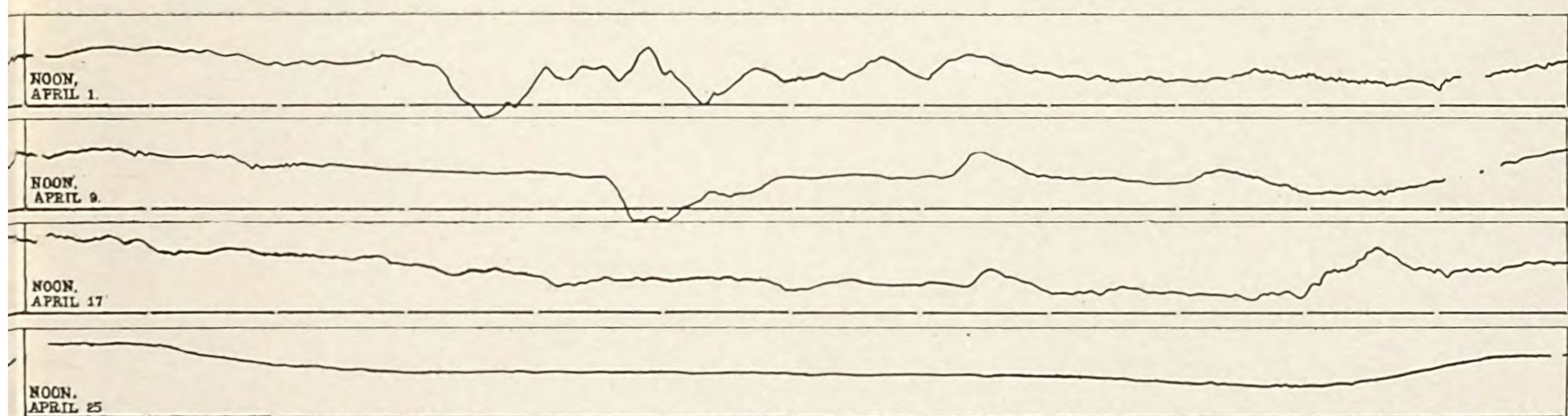
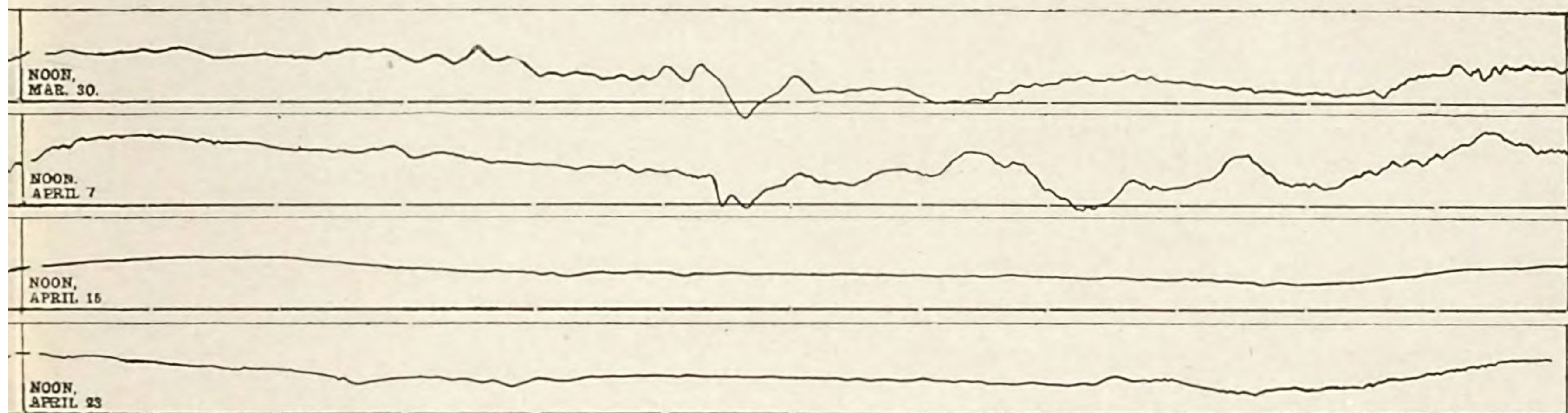
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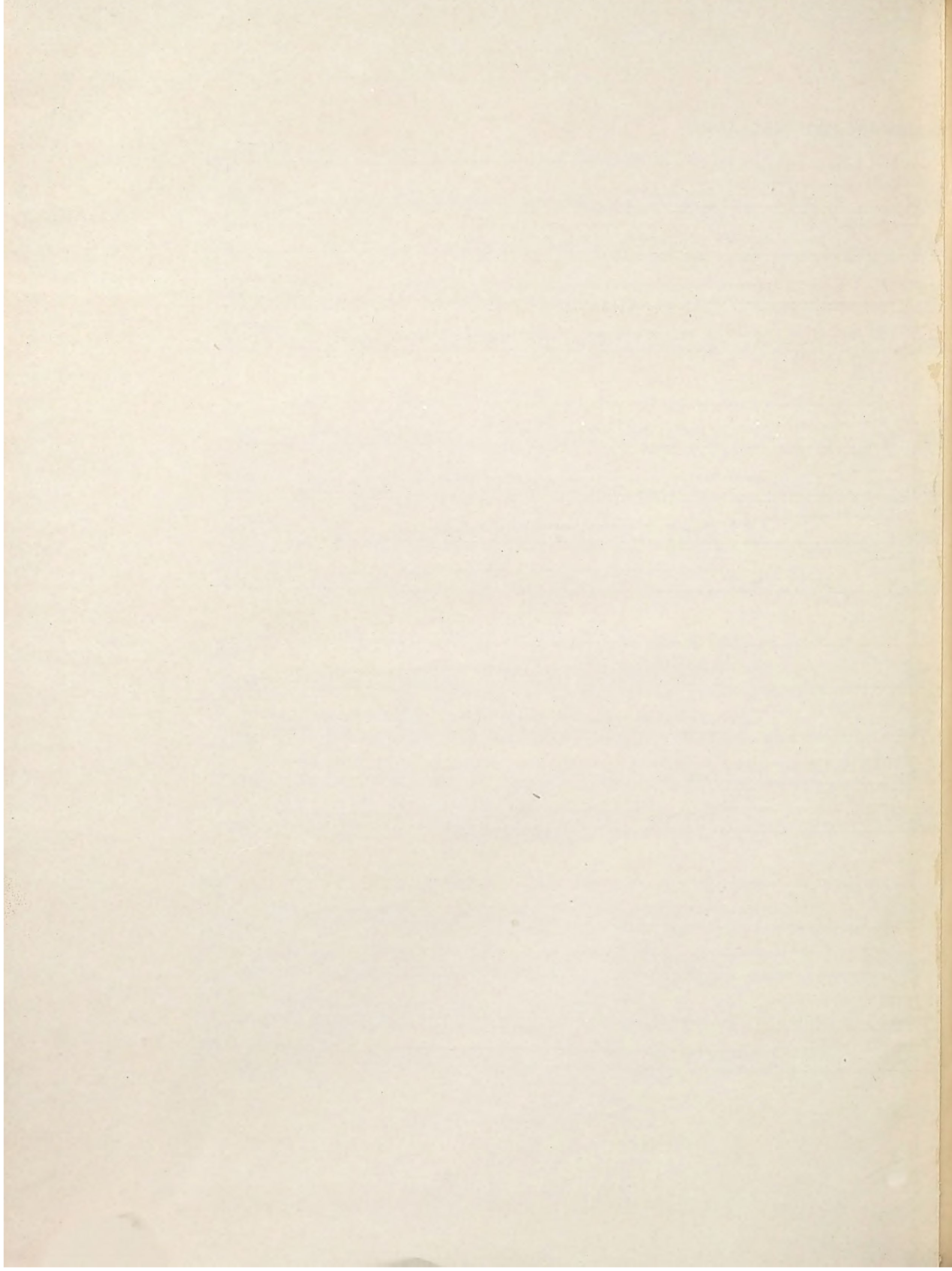
Washington Observations 1888, Appendix 2



WESTERLY) FOR 1891 APRIL

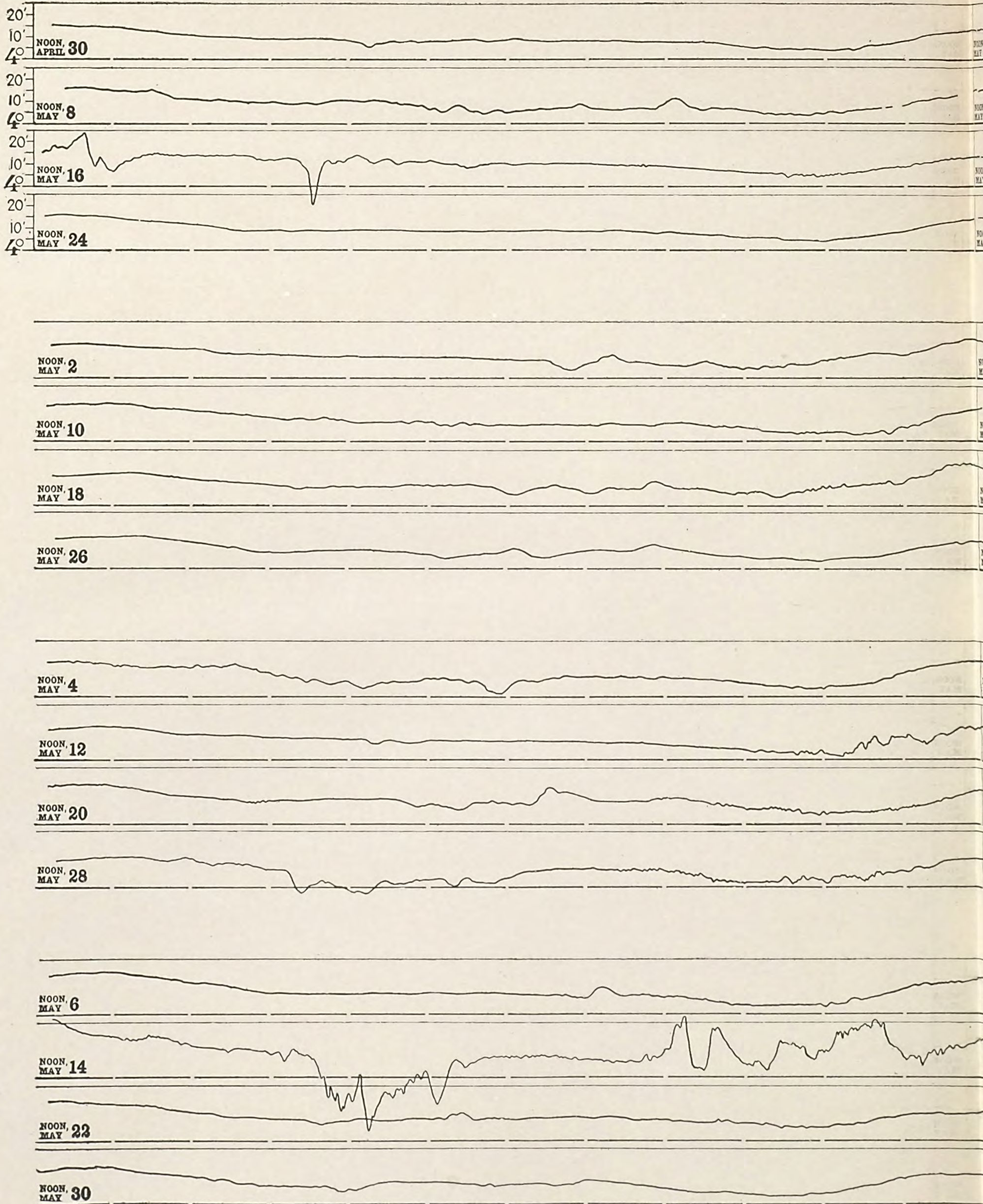
PLATE 1





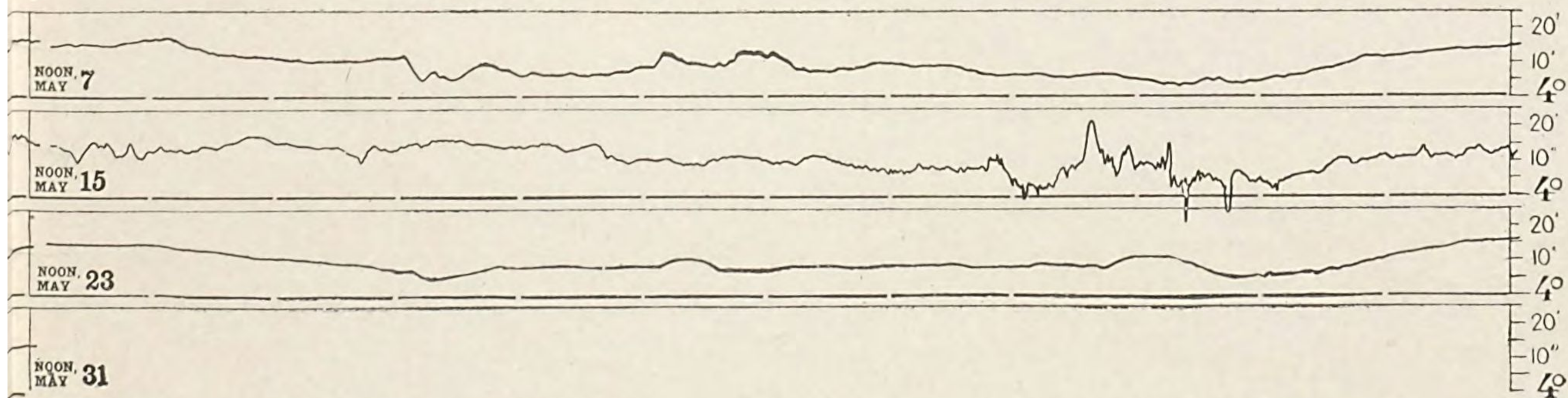
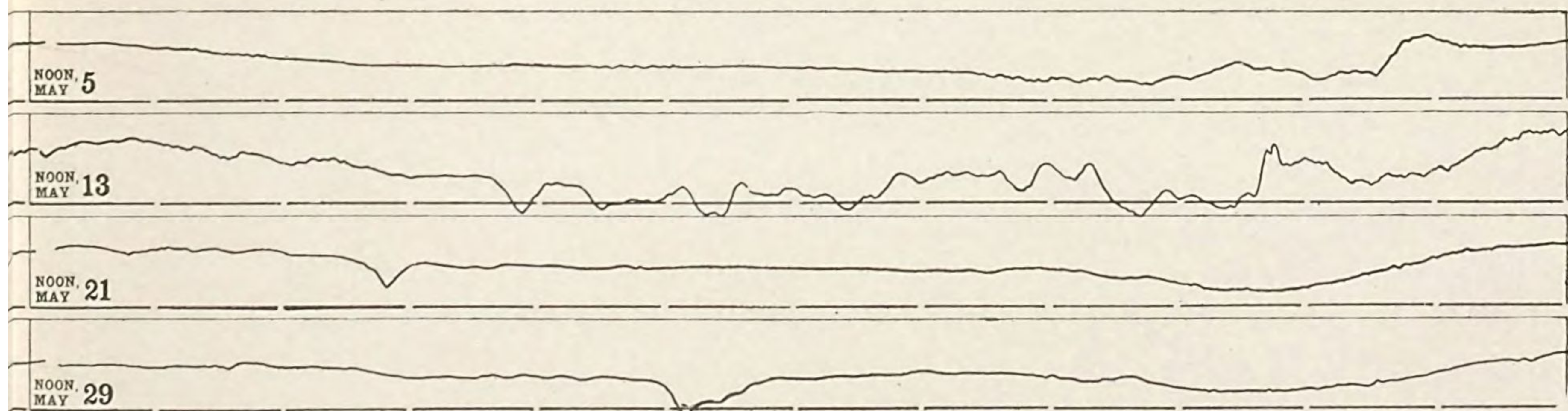
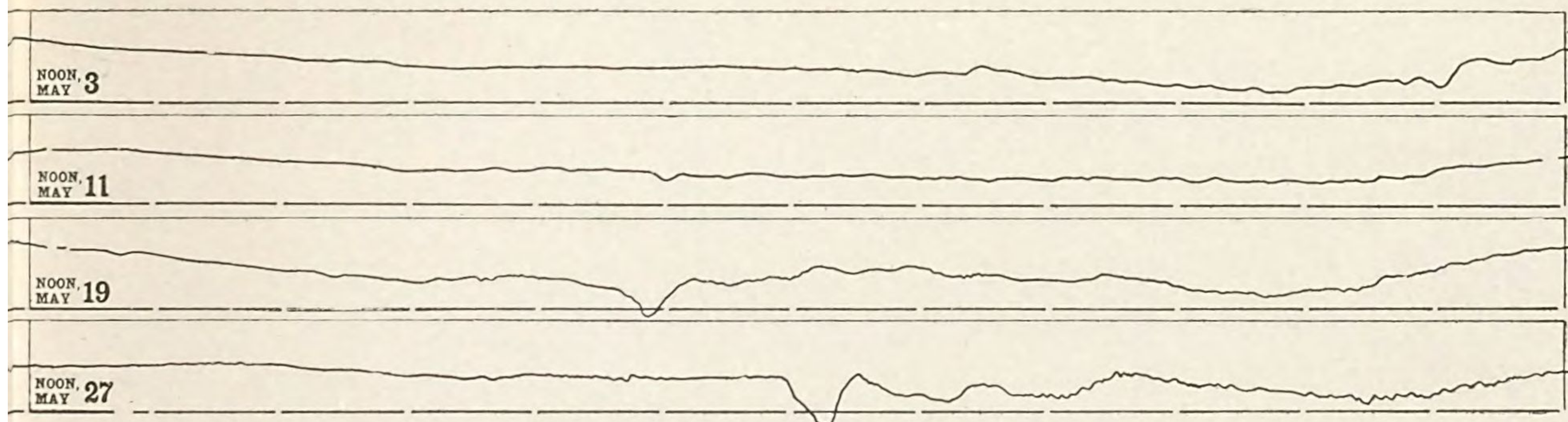
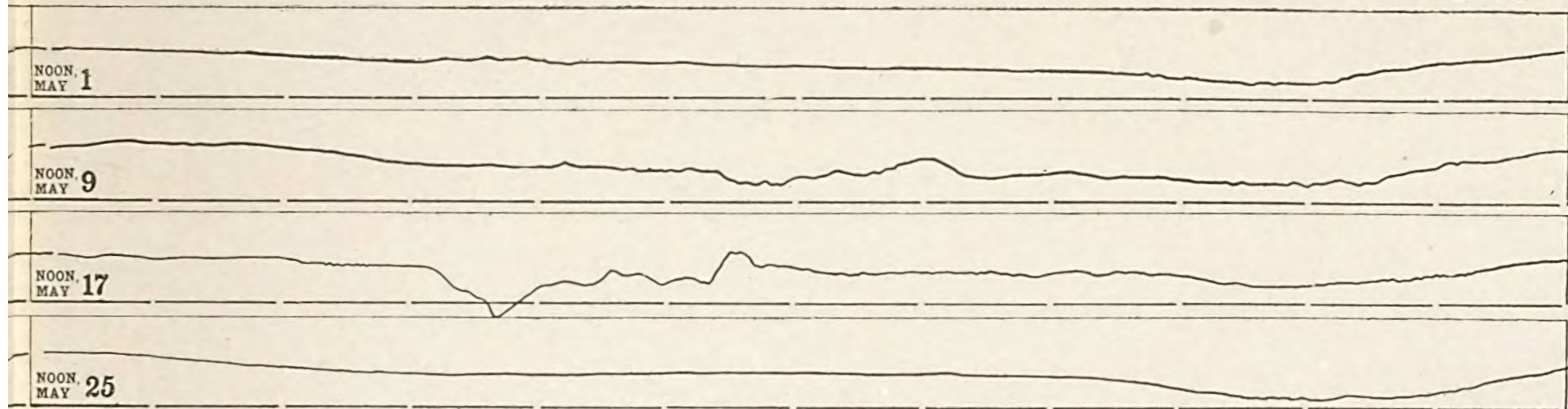
MAGNETIC DECLINATION (WE)

Washington Observations 1888, Appendix 2



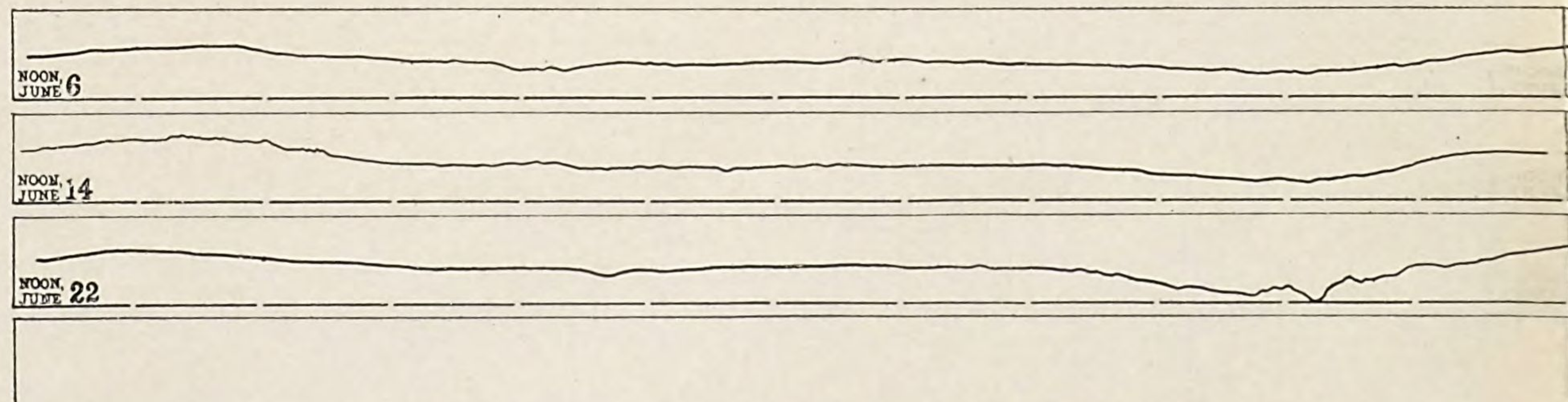
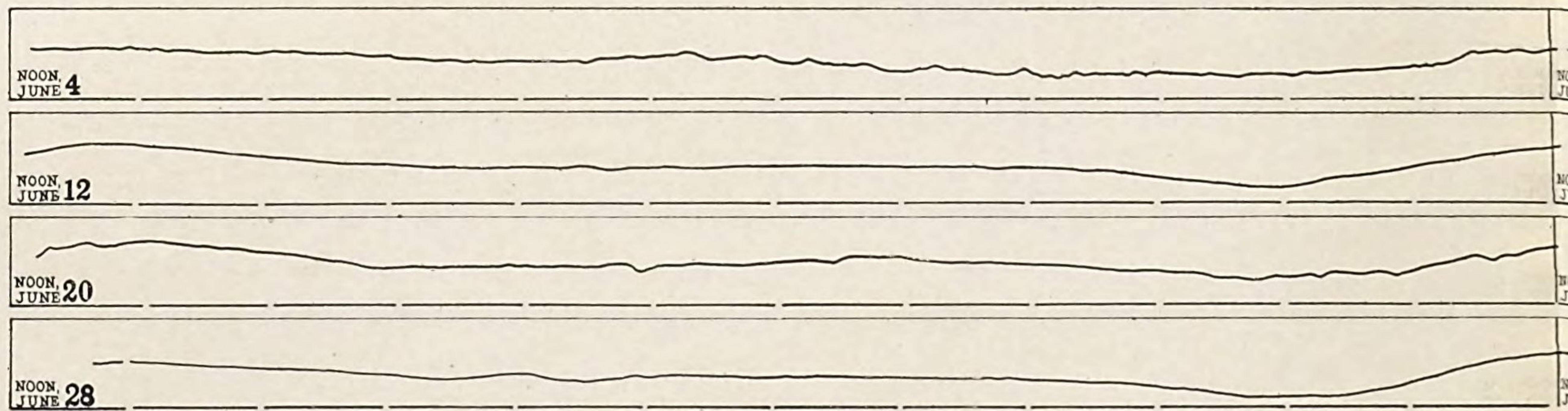
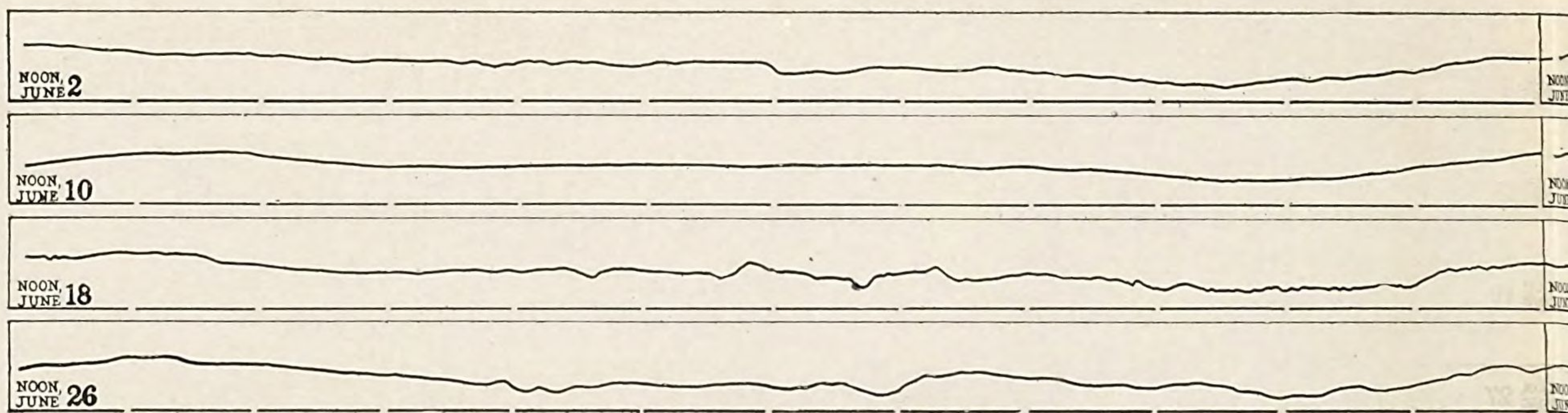
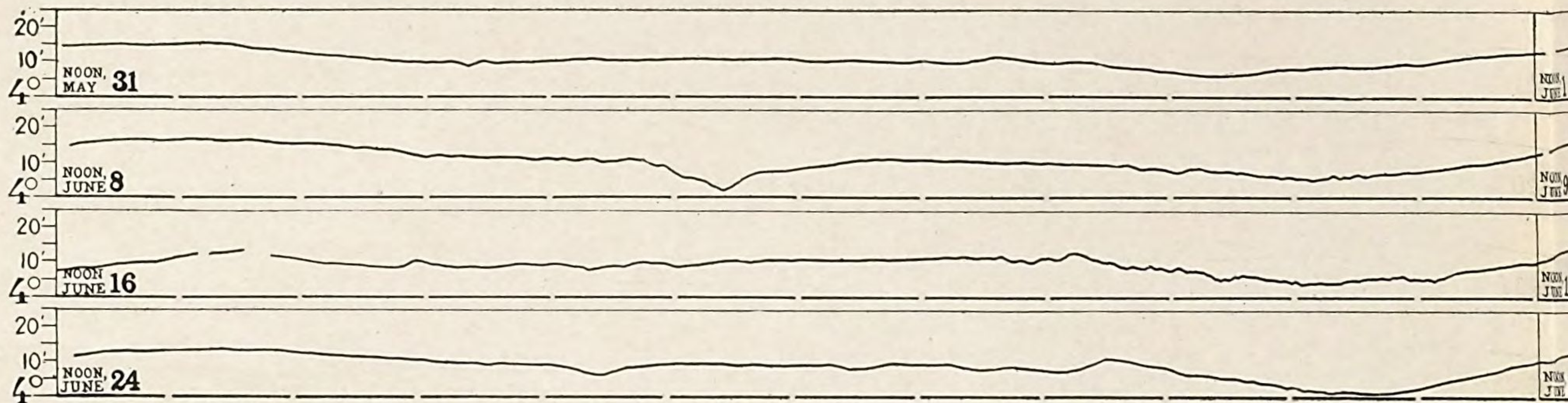
(WESTERLY) FOR 1891 MAY

PLATE 2



MAGNETIC DECLINATION (WEST)

Washington Observations 1888, Appendix 2



WESTERLY) FOR 1891 JUNE

PLATE 3

NOON,
JUNE 1

NOON,
JUNE 9

NOON,
JUNE 17

NOON,
JUNE 25

NOON,
JUNE 3

NOON,
JUNE 11

NOON,
JUNE 19

NOON,
JUNE 27

NOON,
JUNE 5

NOON,
JUNE 13

NOON,
JUNE 21

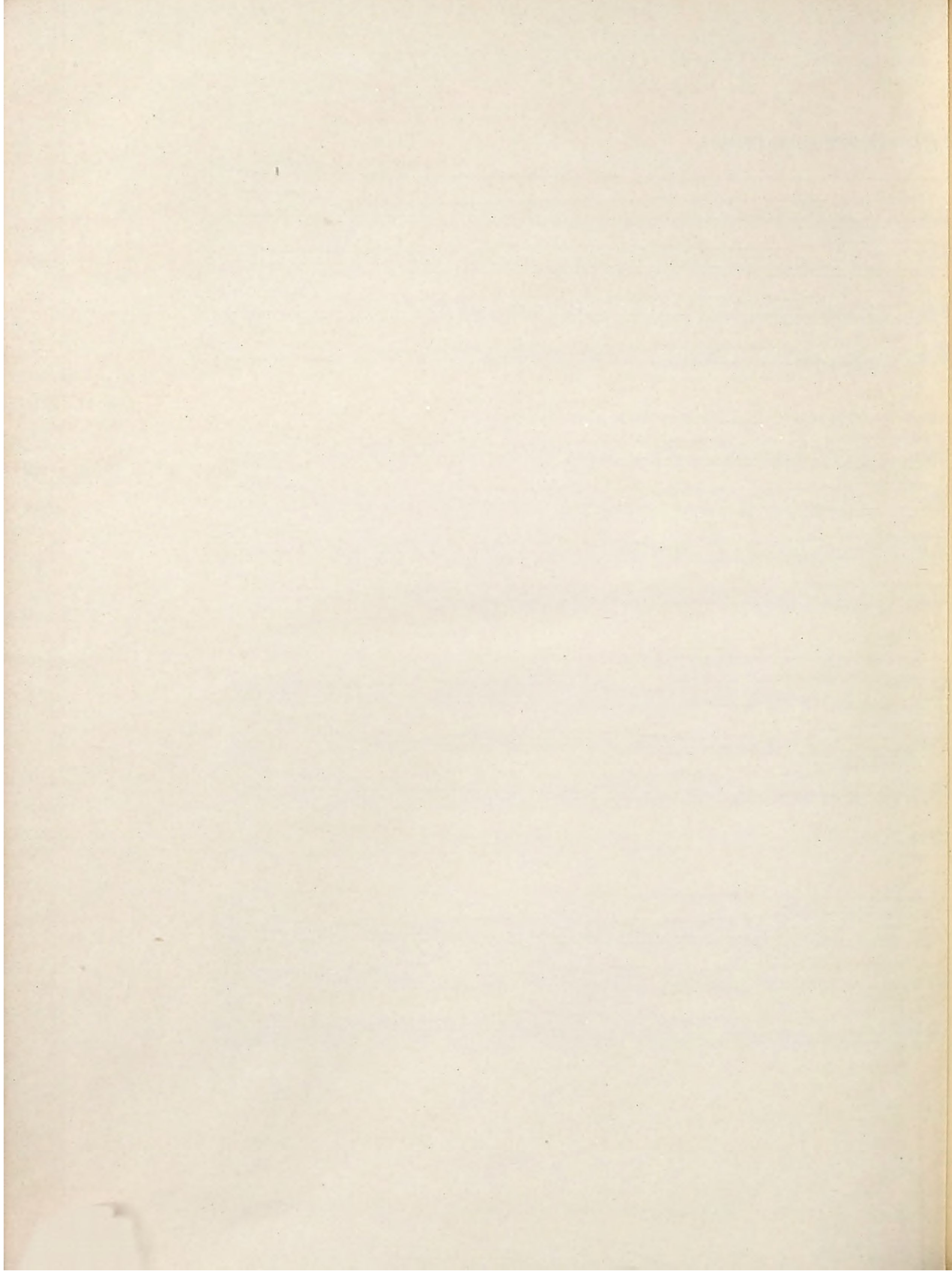
NOON,
JUNE 29

NOON,
JUNE 7

NOON,
JUNE 15

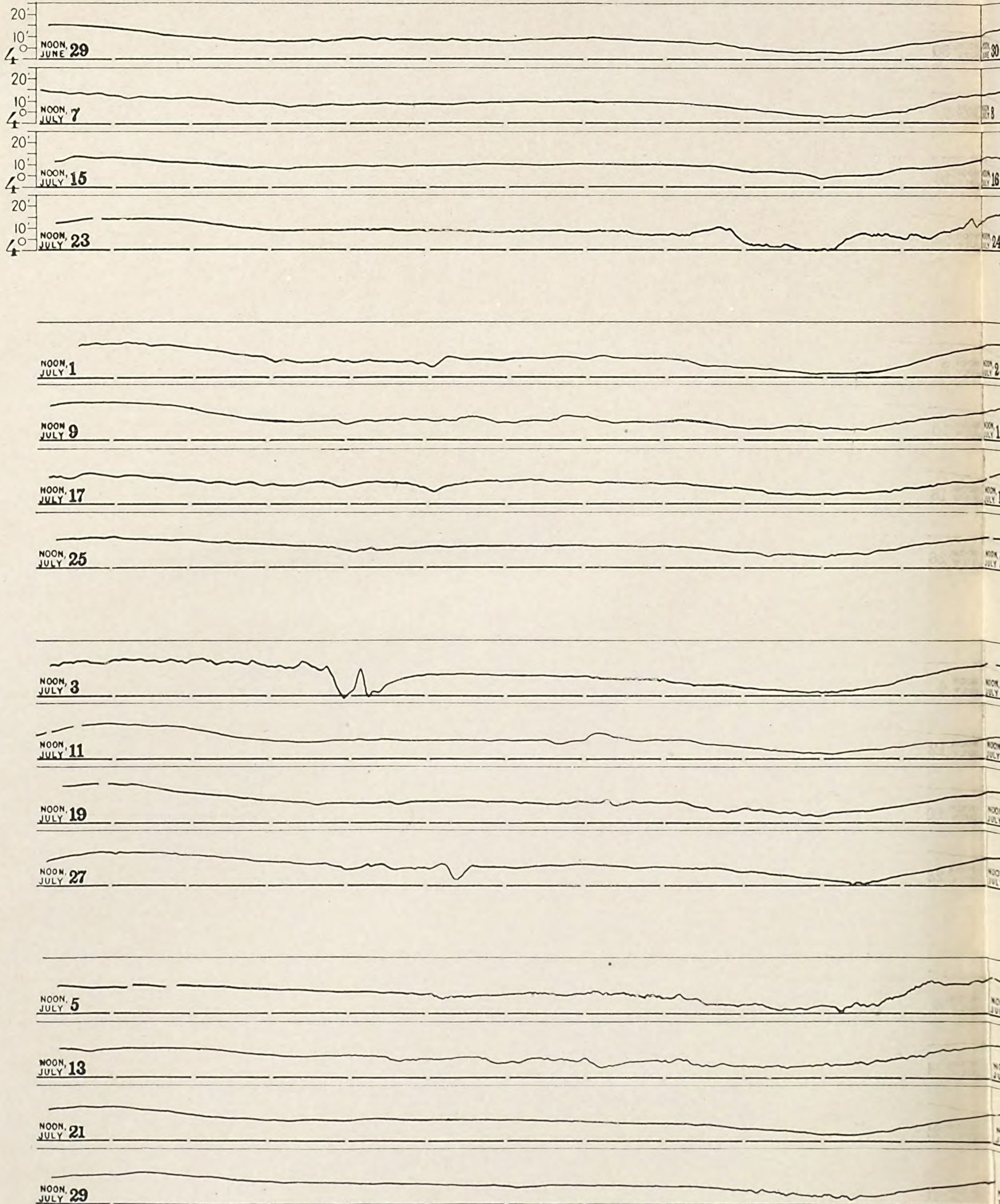
NOON,
JUNE 23

20'
10'
4°
20'
10'
4°
20'
10'
4°
20'
10'
4°



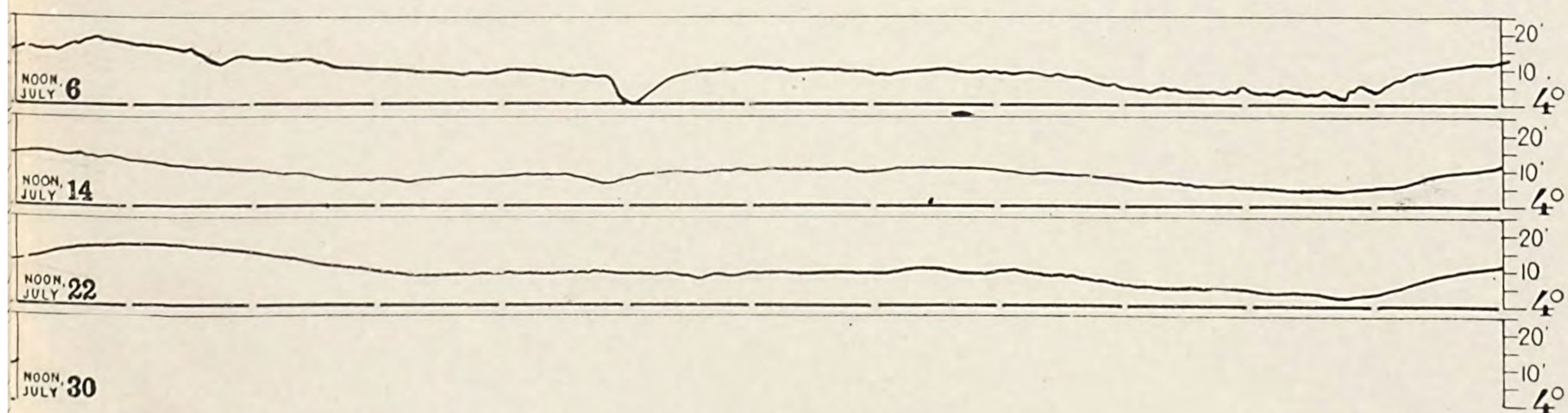
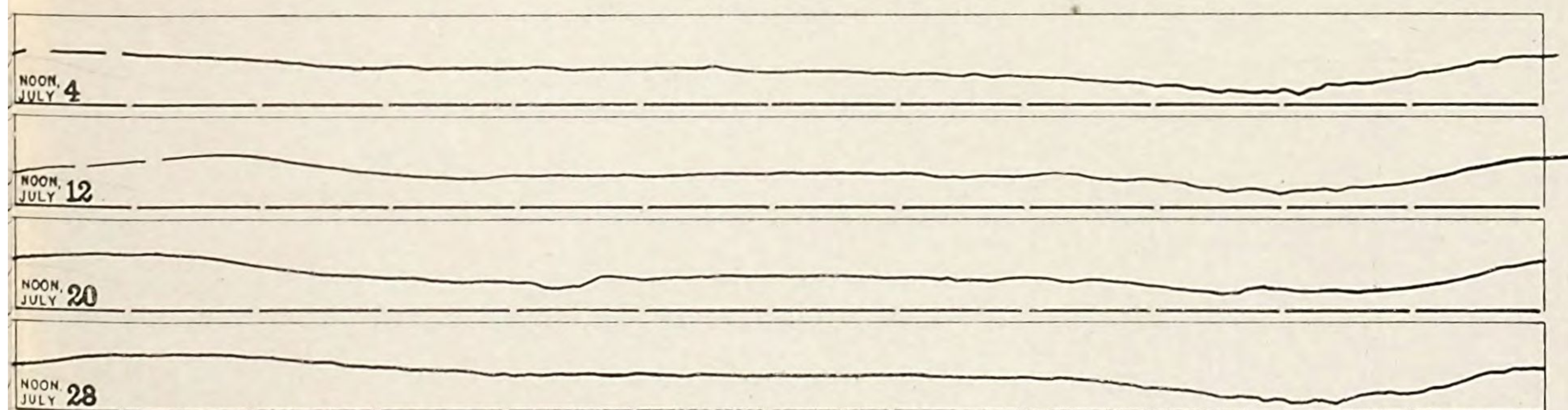
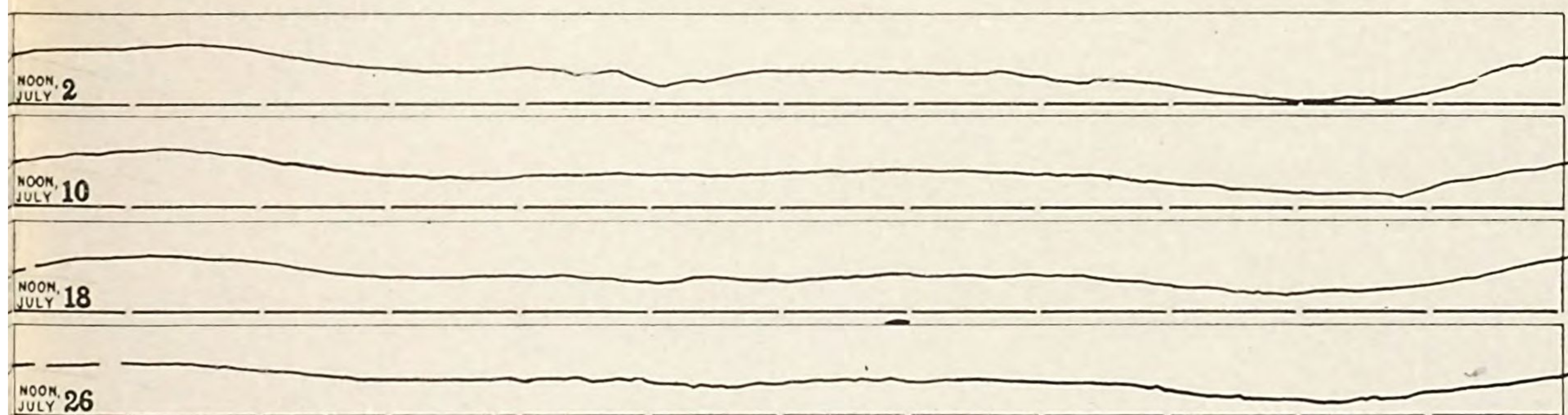
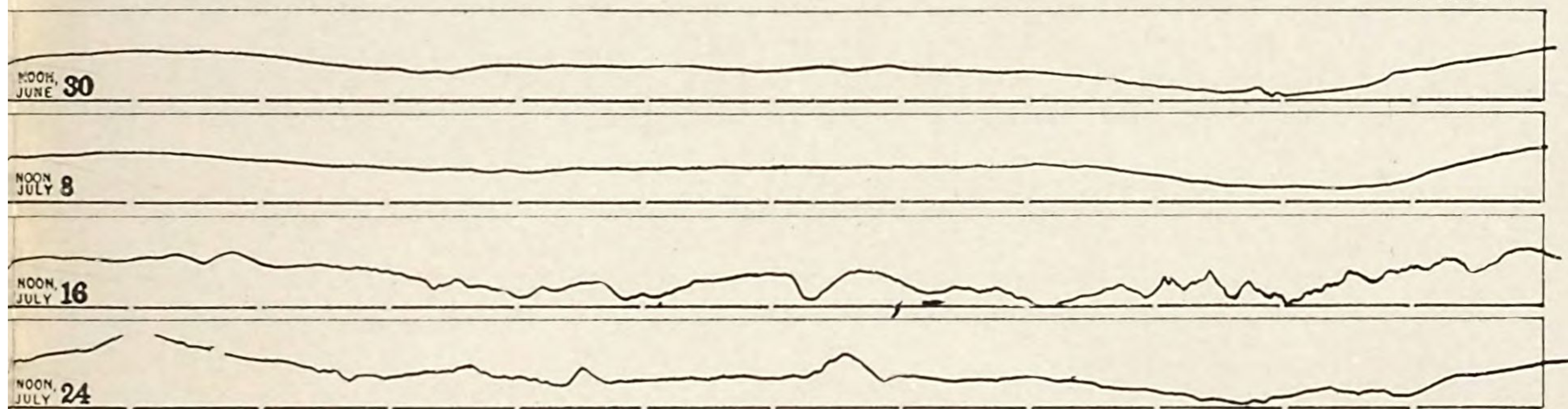
MAGNETIC DECLINATION (WEST)

Washington Observations 1888, Appendix 2



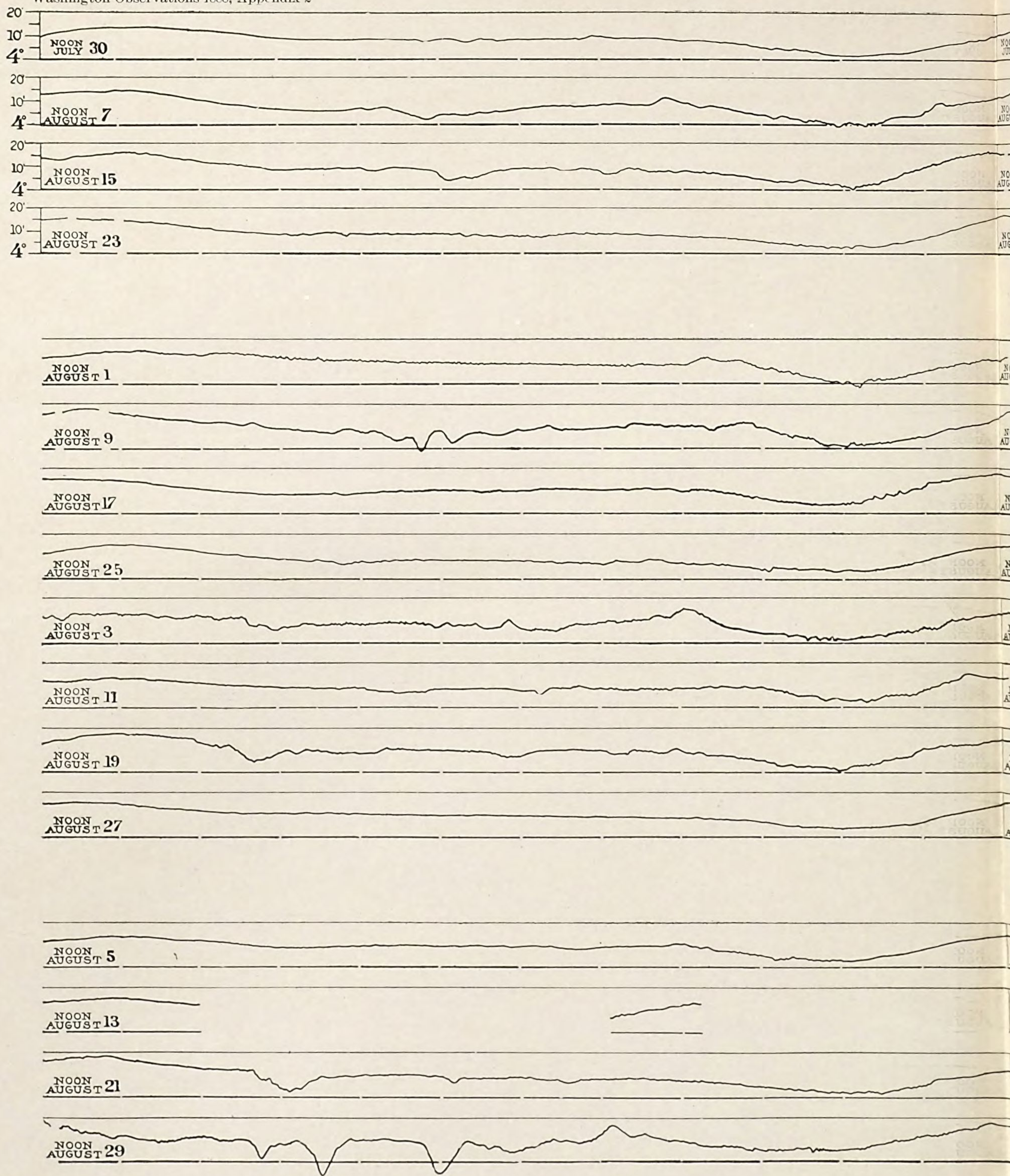
WESTERLY) FOR 1891 JULY

PLATE 4



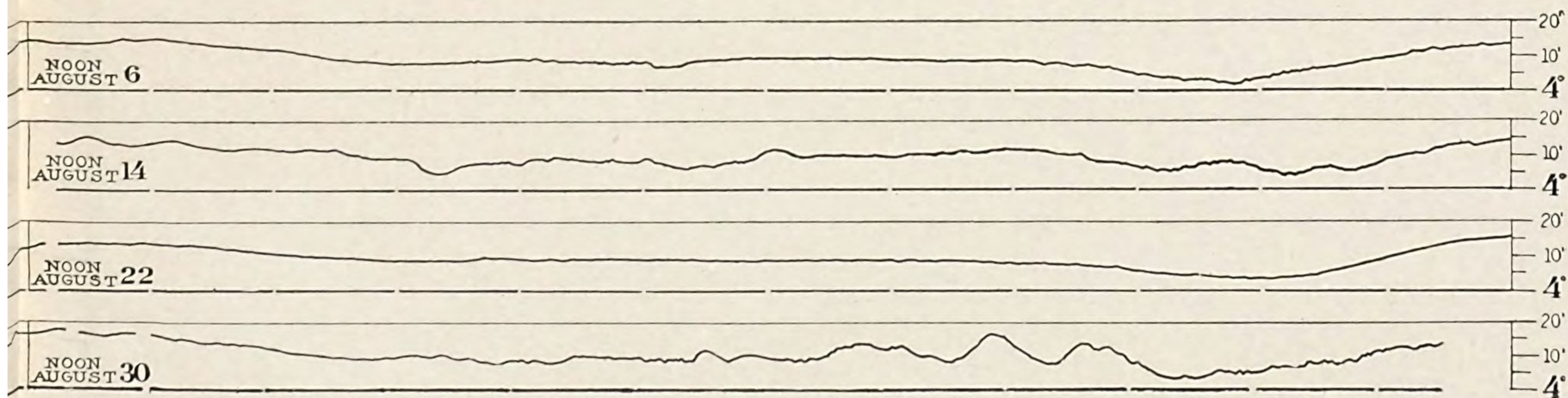
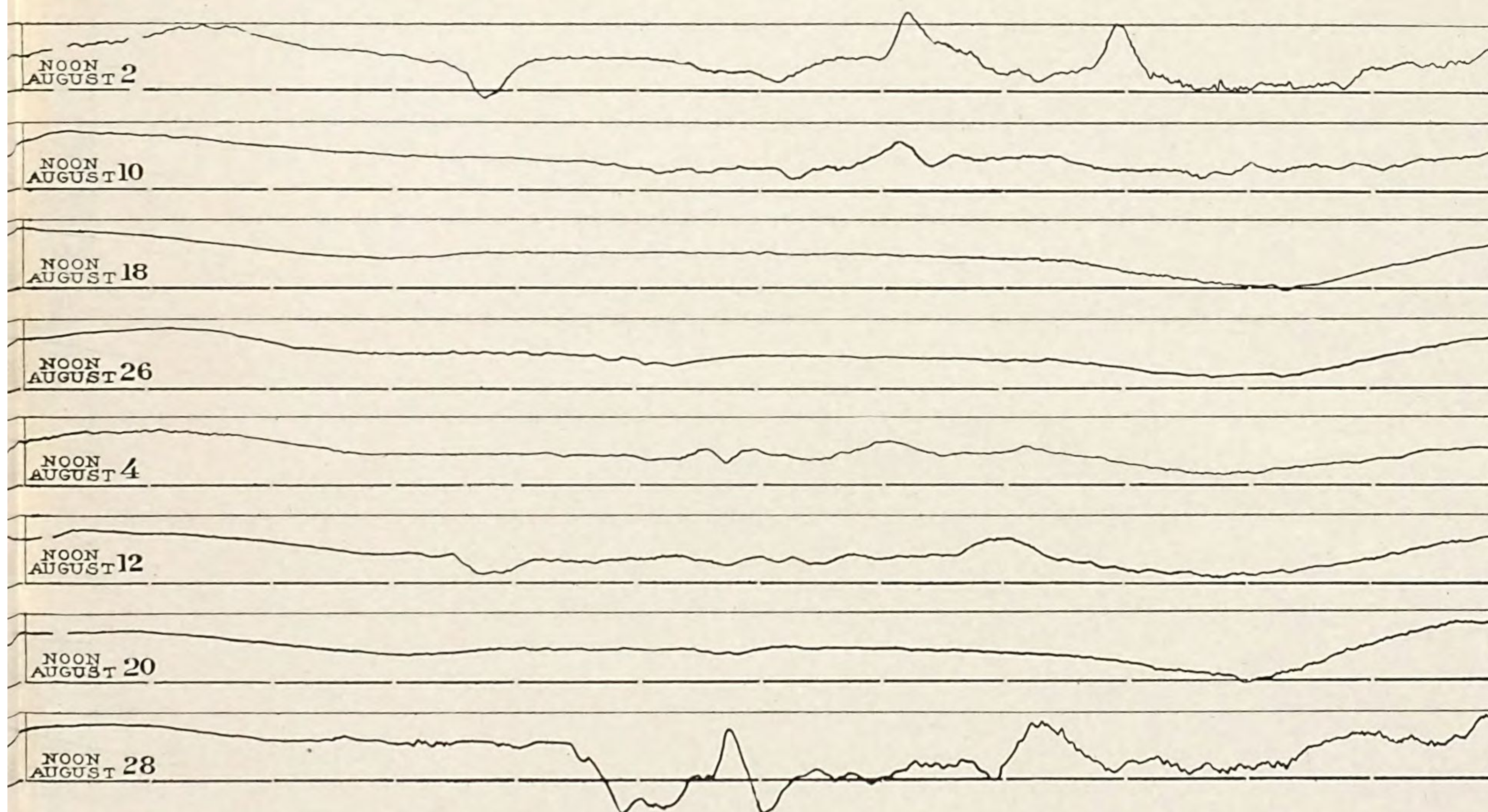
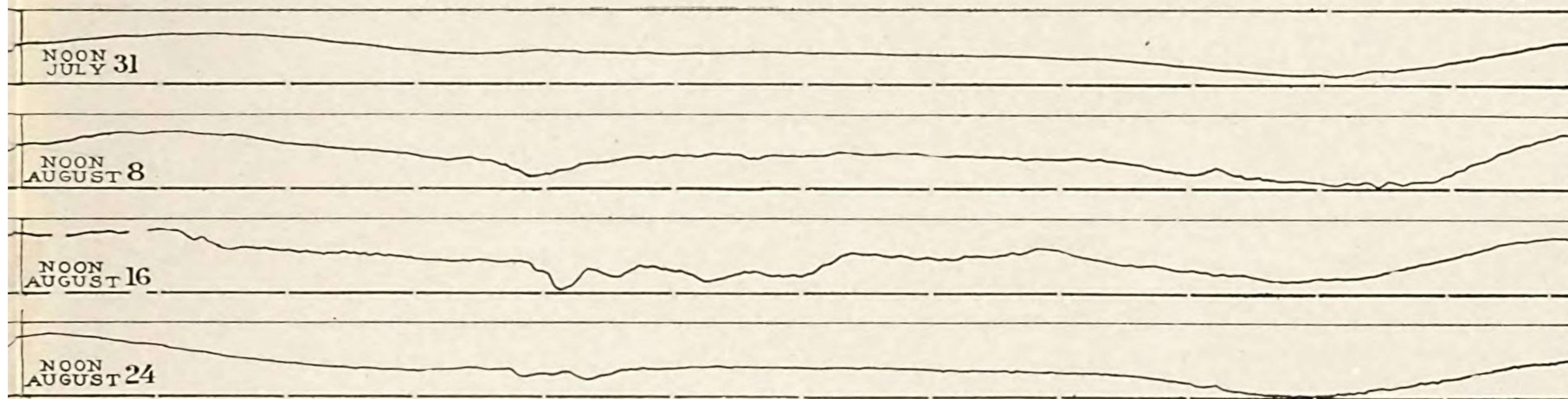
MAGNETIC DECLINATION (WESTER

Washington Observations 1888, Appendix 2



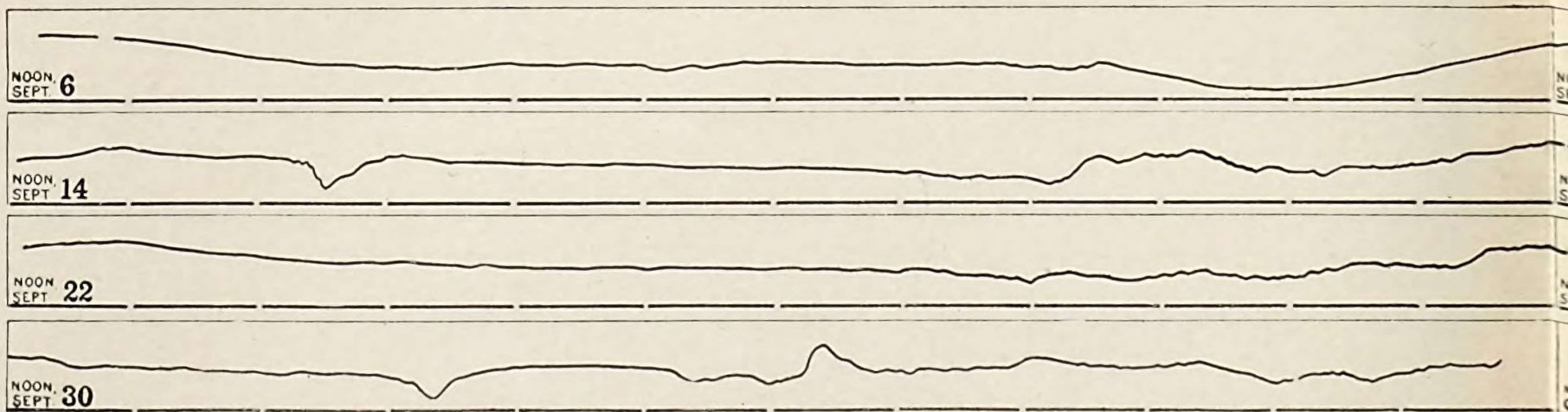
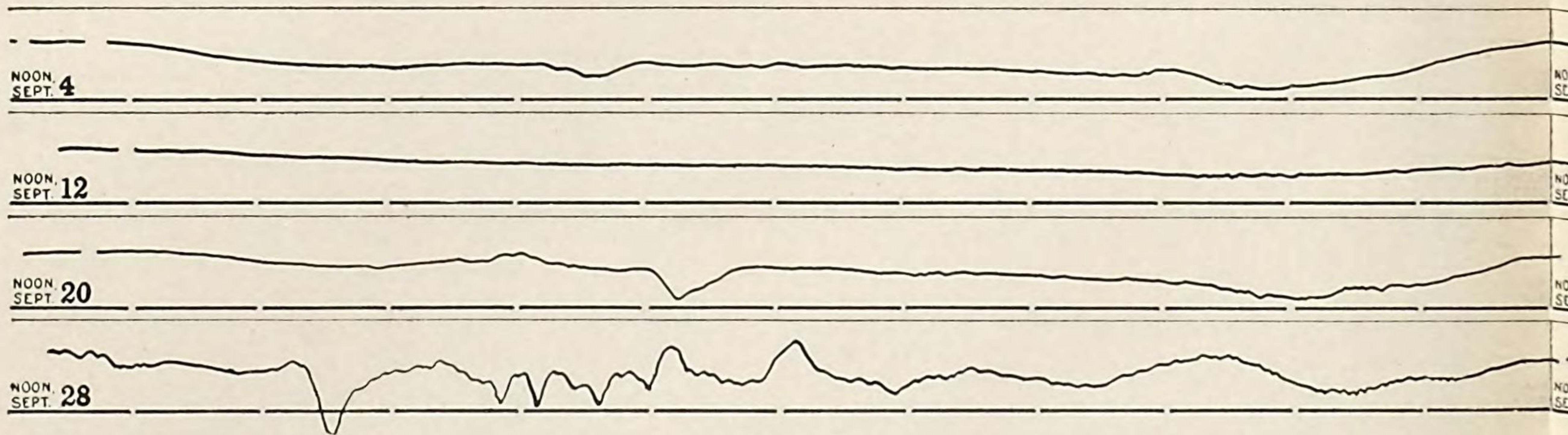
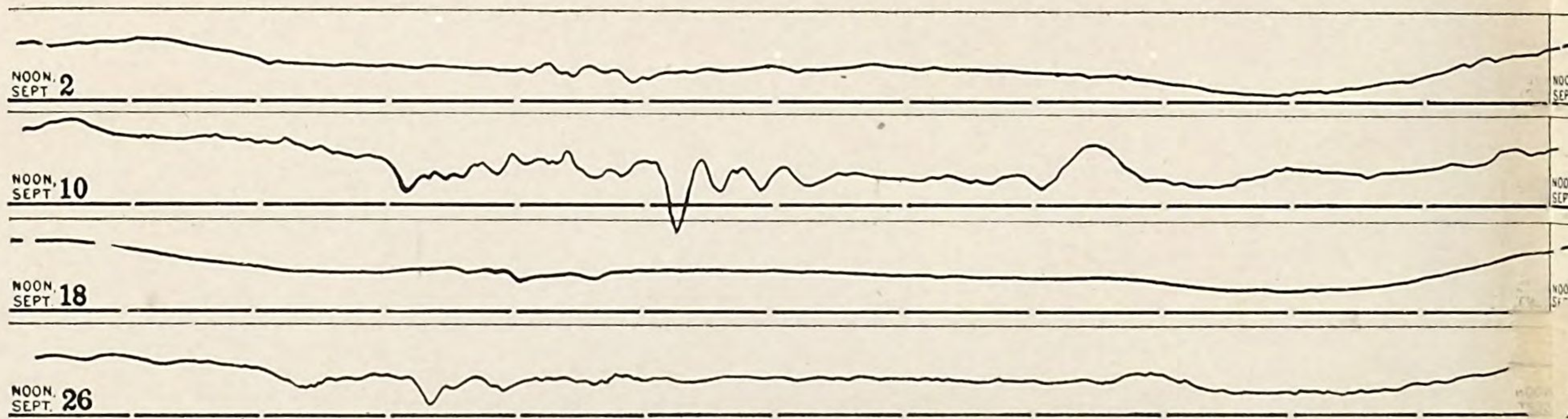
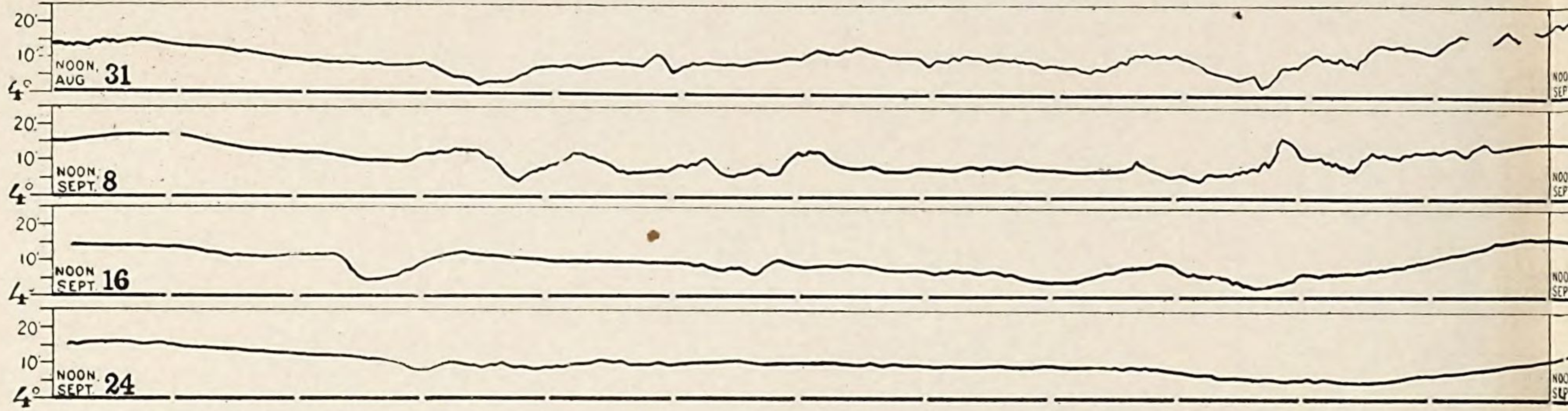
STERLY) FOR 1891 AUGUST

PLATE 5



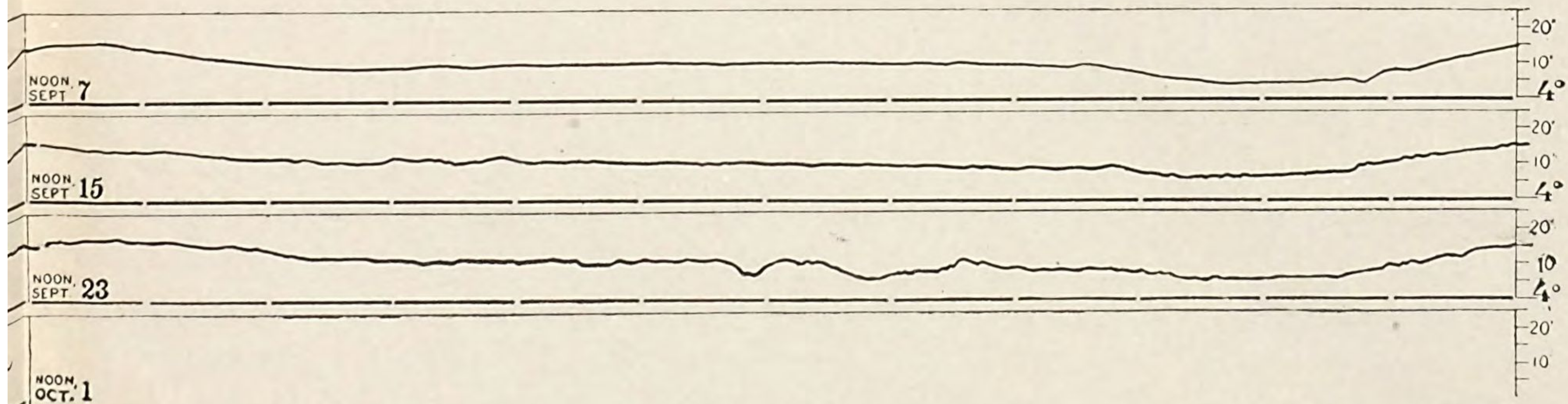
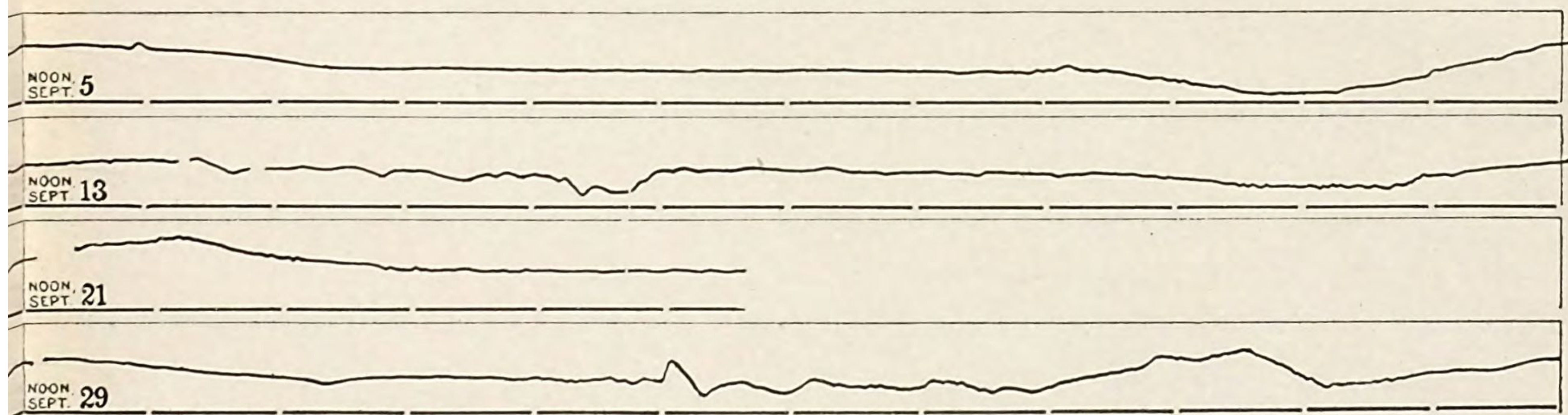
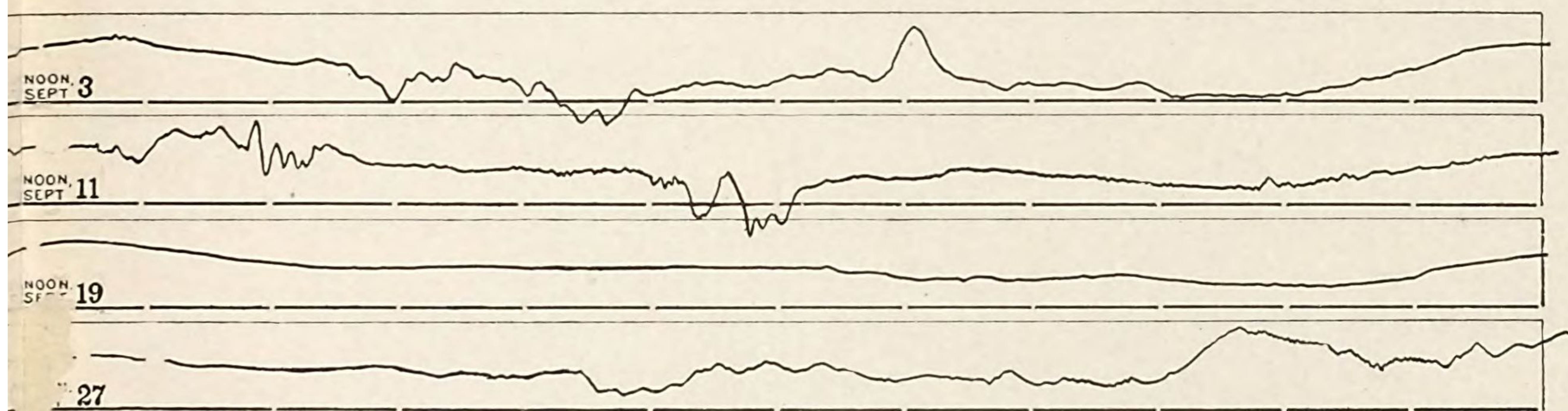
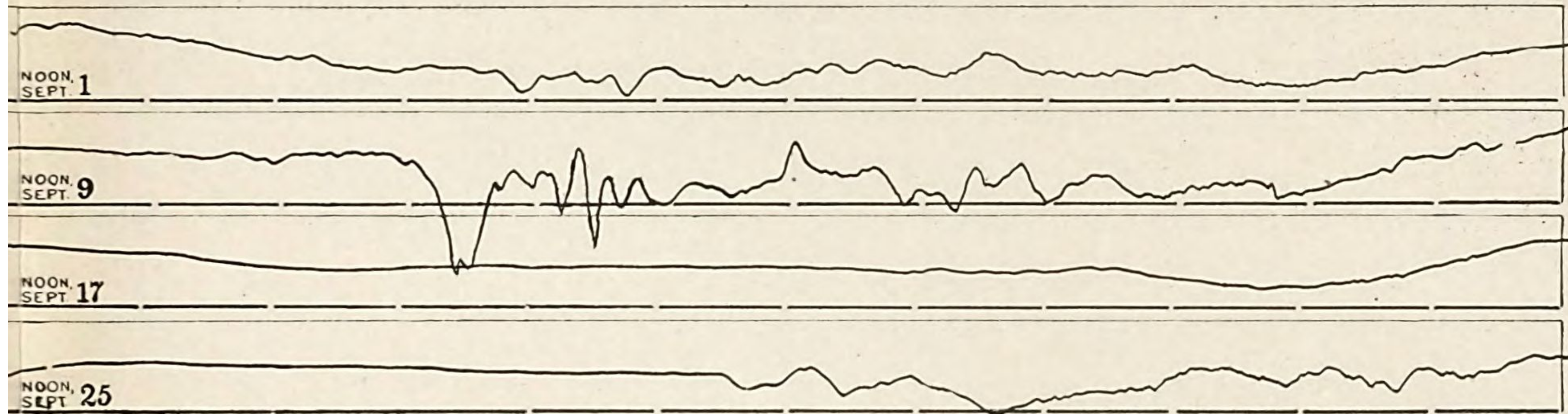
MAGNETIC DECLINATION (WESTER)

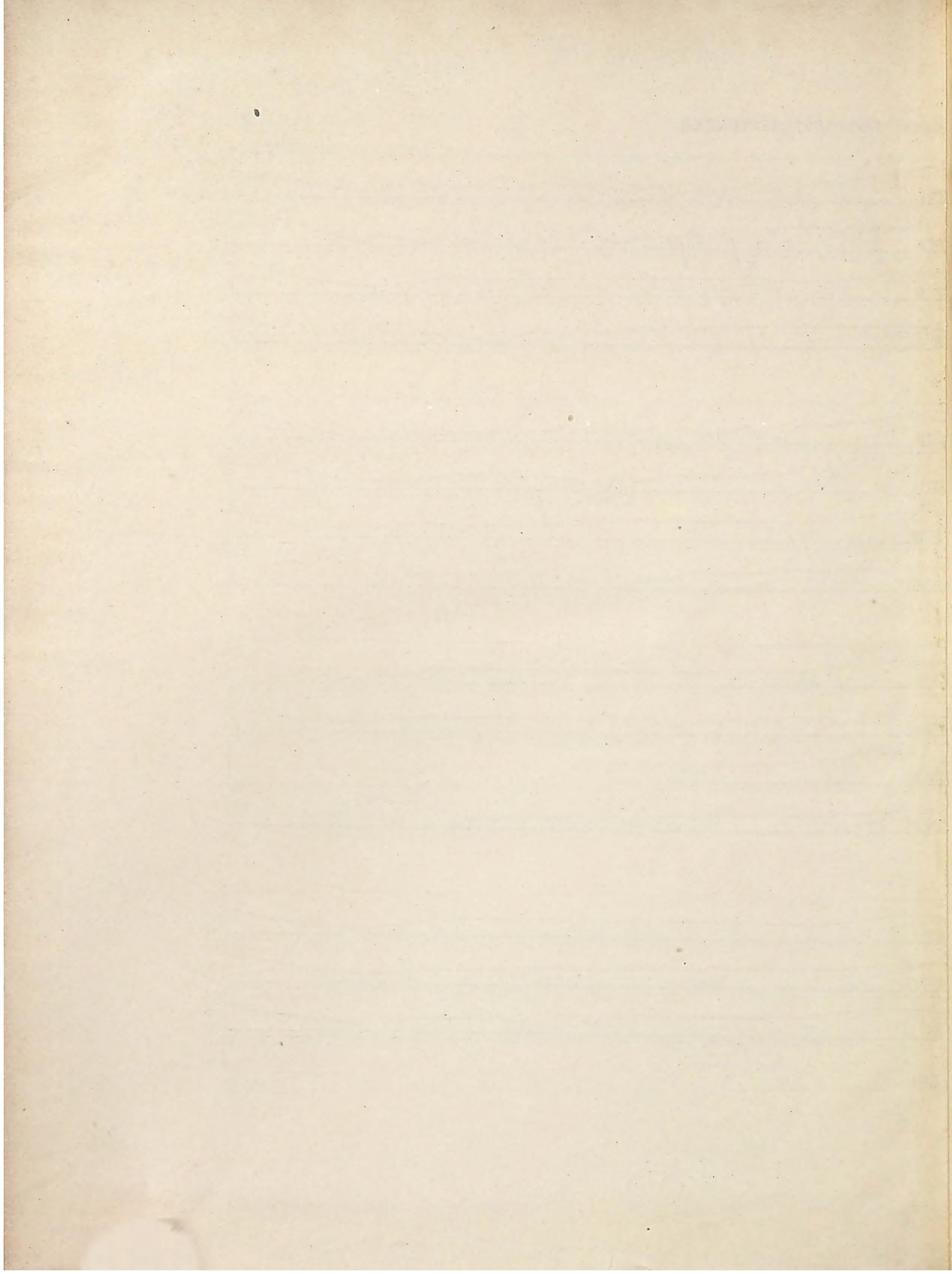
Washington Observations 1888, Appendix 2



STERLY) FOR 1891 SEPTEMBER

PLATE 6





House documents

Bd.: [431.] 1891/92, Vol. 38 = Congress 52, Sess. 1

Washington, DC 1892

Am.b. 3040-431,38

urn:nbn:de:bvb:12-bsb11548718-1